

*European Research Community on Flow, Turbulence and Combustion*

**SCHEDULE**

**ERCOFTAC COMMITTEE MEETINGS**

**Tuesday 18<sup>th</sup> May 2010**

**TU-Delft, Delft, The Netherlands.**

**Aula Congress Centre, TU-Delft, Mekelweg 5, NL-2628 CD, Committee rooms 3 and 4.**

**8.30-9.00** Reception

**9.00-12.00** *SPC and IPC Committee meetings to be held in parallel*

**12.00-13.00** Buffet lunch

**13.00-16.30** *Executive Committee meeting*

Coffee breaks at 10:00 and 15:00.

**Documents attached**

1. Agendas for the SPC, IPC and EC meetings
2. Minutes of the Ercoftac Committee meetings held in Lausanne on the 2<sup>nd</sup> October 2009
3. Applications for SIG funding for 2011
4. Ercoftac Workshop and Summerschool status report
5. Applications for ERCOFTAC event sponsorship and overdue reports
6. ERCOFTAC financial report

# *European Research Community on Flow, Turbulence and Combustion*

## **AGENDA**

### **SCIENTIFIC PROGRAMME COMMITTEE MEETING**

**18<sup>th</sup> May 2010, Delft, The Netherlands**

**Aula Congress Centre, TU-Delft, Committee rooms 3 and 4**

**9:00**

**Scientific Committee meeting, chaired by Prof. Geurts**

1. Approval of the agenda
2. Approval of minutes from the SPC meeting held in Lausanne on 2.10.2009
3. Action items from the from the SPC meeting held in Lausanne on 2.10.2009
4. Special Interest Groups
  - i. Current status report
  - ii. SIG funding requests
5. Pilot Centres
6. Workshops and summer schools
  - i. Status of reports from previous events
  - ii. Consideration of new proposals
7. Status of ETMM8
8. ERCOFTAC 2010 DaVinci Award
9. The future of ERCOFTAC
10. ERCOFTAC publications
  - i. FTAC Journal
  - ii. ERCOFTAC Book series
  - iii. ERCOFTAC Bulletin
  - iv. QNET-CFD Knowledge Base
11. Any Other Business
12. Dates and location of the next SPC meeting

**12:00**

**End of meeting**

**AGENDA**

**INDUSTRIAL PROGRAMME COMMITTEE MEETING**

**18<sup>th</sup> May 2010**

**Committee rooms 3 & 4, Aula Congress Centre, TU-Delft**

**09:00 Meeting chaired by Prof Rene Oliemans**

1. Apologies for absence
2. Approval of the agenda.
3. Minutes of IPC meeting held in Lausanne on 2<sup>nd</sup> October 2009
4. ERCOFTAC industrial strategy
  - i. Status of industry events planned for 2010 (Richard Seoud)
  - ii. Prospects for new industrial members in 2010 (Richard Seoud)
  - iii. Financial forecast for 2010 (Richard Seoud)
  - iv. Brief feedback from delegates at industry events in Autumn 2009 (Richard Seoud)
  - v. Present and review proposals for industry events for 2011 (Richard Seoud, All)
  - vi. IEO support assistant (Prof Hutton)
5. QNET-CFD Wiki (Prof Rodi)
  - i. Present status
  - ii. Future plans, including marketing
6. Best Practice Guidelines
  - i. Dispersed Multi-Phase Flow BPG (Prof Oliemans)
  - ii. Industrial CFD BPG, 2<sup>nd</sup> edition (Prof Hutton)
  - iii. Other BPG: Combustion, Heat transfer (Richard Seoud)
7. Next Chair of IPC
8. Autumn Festival and IPC meeting
9. Any Other Business

**12:00 End of meeting**

# *European Research Community on Flow, Turbulence and Combustion*

## **AGENDA**

### **EXECUTIVE COMMITTEE MEETING**

**18<sup>th</sup> May 2010, Delft, The Netherlands**

**Aula Congress Centre, TU-Delft, Committee rooms 3 and 4**

**14:00            Managing Board meeting, chaired by Prof. Hutton**

1. Approval of the agenda
2. Approval of minutes of the MB-GA meetings held in Lausanne on 2.10.2009
3. Action items from the MB-GA meetings held in Lausanne on 2.10.2009
4. The evolution of ERCOFTAC and its future operation
5. Election of new Managing Board members
6. Financial report
7. Report from Administration and Development Office
8. Report from Coordination Centre
9. Report from Scientific Programme Committee
10. Report from Industrial Programme Committee
11. Composition of the IPC
12. Status of ERCOFTAC products and services
  - i. ERCOFTAC Website
  - ii. QNET-CFD Knowledge Base
  - iii. ERCOFTAC Bulletin
  - iv. ETMM8
  - v. FTAC Journal
  - vi. ERCOFTAC Book series
  - vii. ERCOFTAC Best Practice Guidelines
  - viii. ERCOFTAC Classic Database
13. Any Other Business
14. Dates and location of the next MB-GA and EC meetings

**16:45            End of meeting**

# *European Research Community On Flow, Turbulence and Combustion*

## **SCIENTIFIC PROGRAMME COMMITTEE MEETING**

**2<sup>nd</sup> October 2009, Lausanne, Switzerland**

### **ATTENDANCE**

Borhani, N.  
Braza, M.  
Cambon, C.  
Choi, K-S.  
Comte, P.  
da Silva, C.  
Dick, E.  
Gronke, C.  
Hämäläinen, J.  
Hutton, T.  
Jakirlic, S.

Leschziner, M.  
Marongiu, J-C.  
Nowakowski, A.  
Quack, M.  
Redondo, J.  
Rodi, W.  
Sommerfeld, M.  
Tomboulides, A.  
Van Steenhoven, A.  
Vlachos, N.  
Von Terzi, D.

### **APPOLOGIES**

Castilla, R.  
Gauger, N.  
Geurts, B.J.  
Geuzaine, P.  
Hanifi, A.  
Hunt, J.

Koumoutsakos, P.  
Thome, J.  
Violeau, D.  
Von Rohr, P.  
Wallin, S.

## SUMMARY OF ITEMS ARISING FROM THE MEETING

- *The SPC decided to recommend to the Managing Board that SIG 101 should be closed.*
- *The SPC voted that event and SIG funding applications received later than two weeks before an SPC meeting would no longer be considered.*
- *The SPC decided to recommend to the Managing Board that themed issues of the Bulletin should be made available freely online to promote the activities of the related SIG.*
- *The SPC voted to endorse Prof. Redondo's proposal to create a 'Pan-European laboratory of non-homogenous turbulence'.*

## MINUTES

The meeting was opened by the SPC Chairman, Prof. Leschziner, at 9:00.

### 1. Approval of the agenda

The agenda was approved.

### 2. Approval of minutes from the SPC meeting held in Budapest on the 5.5.2009

The minutes were approved.

### 3. Matters arising and review of action items from the SPC meeting held in Budapest on the 5.5.2009

- Prof. Leschziner wrote to all SIG Coordinators to clarify their responsibilities, including keeping their ERCOFTAC webpages up to date.

### 4. Special Interest Groups

#### i. Current status report

Recent SIG activities were reviewed by Prof. Leschziner using information posted on their ERCOFTAC website pages. Some specific comments and decisions were:

*SIG 1 Large Eddy Simulation:* Although an active SIG, its webpage was not up to date.

*SIG 5 Environmental CFD:* Efforts to find a new coordinator had not been successful. Since this is an important field of research, Prof. Leschziner will continue to search for a suitable candidate.

*SIG 14 Stably stratified and rotating flows:* The SIG webpage is empty. Prof. Redondo reported that although the SIG is active, the bad management and the unclear submission procedures of the ERCOFTAC website did not motivate coordinators to spend time on this task.

*SIG 24 Variable density turbulent flows:* The SIG webpage is empty. Prof. Leschziner commented that this SIG should be closed if it remains inactive.

*SIG 32 Particle image velocimetry:* The SIG webpage is empty.

*SIG 34 Design optimisation:* The SIG webpage is not up to date. Prof. Leschziner will write to Prof. Giannakoglou to encourage greater activity.

*SIG 35 Multipoint turbulence structure and modelling:* The SIG webpage is not up to date. Prof. Cambon commented that updates had been sent but had not been implemented efficiently.

SIG 36 *Swirling flows*: Out of date ERCOFTAC webpage. However, Dr. Braza reported that the SIG was active and had an up to date self hosted webpage. She added that updates sent for publishing online had not been implemented efficiently.

SIG 38 *Microfluidics and micro heat transfer*: Prof. Leschziner will write to Dr. Tardu to encourage him to publish the activities of this reactivated SIG on the ERCOFTAC website.

SIG 39 *Aeroacoustics*: This SIG webpage is empty. Prof. Leschziner will write to its coordinator to encourage greater activity.

SIG 41 *Fluid-structure interactions*: The SIG webpage is out of date. Prof. Leschziner will contact Dr. Longatte to encourage her to reactivate the SIG, close the SIG, or identify a new coordinator.

SIG 101 *Quality and trust in industrial CFD*: Although very active, the SIG webpage is empty.

*\* The SPC decided to recommend to the Managing Board that SIG 101 should be closed.*

## **ii. SIG funding requests**

The SPC voted to recommend to the Managing Board that a further four SIGs should be funded for up to 3000 Euros during 2010. These SIGs were:

SIG 20 *Drag reduction and flow control*

SIG 28 *Reactive flows*

SIG 35 *Multipoint turbulence structure and modelling*

SIG 42 *Synthetic models in turbulence*

Requests for reimbursements by these funded SIGs should be made to the ERCOFTAC ADO in Brussels. For invoiced items, the ADO should be provided with receipts, a short justification, and bank details. All reimbursement requests will be audited by the ADO before payment.

## **5. Pilot Centres**

Prof. Leschziner noted the poor state of the Pilot Centre webpages on the ERCOFTAC website.

## **6. Workshop and summer schools**

### **i. Consideration of new proposals**

As a result of a number of late submissions for ERCOFTAC sponsorship of events and SIGs:

*\* The SPC voted that event and SIG funding applications received later than two weeks before an SPC meeting would no longer be considered.*

After discussions, the SPC voted to recommend the following actions to the Managing Board regarding the sponsorship of future events:

**W2009-11** '*Research in turbulence and transition*', Lisbon, Portugal, 16.10.2009.

Application for use of the ERCOFTAC logo was approved.

A scholarship of 2000 Euros was awarded.

**W2009-12** '*Turbulent flows – Velocity gradients and increments*', Ecully, France, 4-5.12.2009.

Application for use of the ERCOFTAC logo was approved.

A scholarship of 2000 Euros was awarded.

**W2010-01** '*Workshop on fibre suspension flows*', Stockholm, Sweden, 9-10.2.2010.

Application for use of the ERCOFTAC logo was approved.

**W2010-02** '*MUSAF colloquium*', Toulouse, France, 27-29.9.2010.

Application for use of the ERCOFTAC logo was approved.

**W2010-03** '*European drag reduction and flow control meeting*', Kiev, Ukraine, 6-9.9.2010.

Application for use of the ERCOFTAC logo was approved.

A scholarship of 2000 Euros was awarded.

- W2010-04** '*Advances and applications of GiD*', Ibiza, Spain, 25-27.5.2010.  
Application for use of the ERCOFTAC logo was rejected.  
Application for funding was rejected.
- W2010-05** '*Two-phase flow predictions*', Halle, Germany, 22-26.3.2010.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 2000 Euros was awarded.
- W2010-06** '*Dynamics of non-spherical particles in fluid turbulence*', Trondheim, Norway, 29.9.2010.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 2000 Euros was awarded.
- S2010-01** '*PIV course*', Gottingen, Germany, 22-26.3.2010.  
Application for use of the ERCOFTAC logo was approved.  
Application for funding was rejected.
- S2010-02** '*Non-normality and non-linearity in thermo-acoustics*', Munich, Germany, 17-21.5.2010.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 3000 Euros was awarded.
- S2010-03** '*Turbulence and mixing in compressible flows*', Oléron Island, France, 13-18.9.2010.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 3000 Euros was awarded.
- S2010-04** '*New challenges in turbulence research*', Les Houches, France, 21-26.2.2010.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 3000 Euros was awarded.

## **7. Status of ETMM8**

Prof. Leschziner reported that abstracts were still being received for ETMM8 even after the deadline. He said that the abstracts will be reviewed in January 2010. He also added that around twenty organisations had been approached for sponsorship, including the French Air force who had agreed to pay for the printing of the conference proceedings.

## **8. Review of the ERCOFTAC Autumn Festival and the 2009 da Vinci Award**

Prof. Leschziner noted the impressive standard of this year's presentations for the 2009 da Vinci Award. He added that this award was important to the credibility of ERCOFTAC, and was a good use of ERCOFTAC funds. However, the SPC urged greater marketing of the event in order to increase its attendance especially by students.

## **9. ERCOFTAC publications**

### **i. FTAC journal**

Prof. Rodi reported that, although the FTAC journal was progressing well, its impact factor had fallen slightly from 0.923 to 0.776. To date in 2009, volume 82 comprising 4 issues and 2 issues of volume 83 had been published. He added that a special issue on ETMM7 will be published shortly. At present, there is a backlog of 31 papers published online that are waiting to be printed. Special issues planned for 2010 include: the '2007 Hybrid RANS LES and unsteady flows conference', the '2008 DNS and LES of chemically reacting flows workshop', and an issue dedicated to the 60<sup>th</sup> birthday of Prof. Pope.

### **ii. ERCOFTAC Book Series**

Prof. Rodi reported that a volume on the '2008 Quality and reliability of LES' workshop had recently been published. He added that the Book Series was still not receiving sufficient contributions. Future planned issues include a volume on the DLES7 workshop.



### **iii. ERCOFTAC Bulletin**

Dr. Borhani commented on the need to reduce the operation and the postage costs of the Coordination Centre. He reported that, after discussions with the Executive Committee, it had been decided that in the future only a single printed copy of the ERCOFTAC Bulletin will be posted to member organisation, with extra printed copies being available at an additional cost. However, free electronic copies will be made available for download from the ERCOFTAC Website by member organisations. Non-members will be able to buy printed copies of the Bulletin. The SPC then discussed if the ERCOFTAC Bulletin should be made freely available online to both members and non-members.

*\* The SPC decided to recommend to the Managing Board that themed issues of the Bulletin should be made available freely online to promote the activities of the related SIG.*

### **iv. QNET-CFD Knowledge Base**

Prof. Rodi reported that the revamped QNET-CFD Knowledge Base had been successfully launched in September, and login details had been emailed to all ERCOFTAC members.

## **10. Any other business**

### **i. ASME 10<sup>th</sup> Symposium on applications in CFD**

Prof. Leschziner reported a communication from Prof. Reeks regarding the 'ASME 10<sup>th</sup> Symposium on applications in CFD' to be held over the 1-4<sup>th</sup> August 2010 in Montreal-Canada. Prof. Reeks indicated that contact with ASME would be beneficial, suggesting that ERCOFTAC should assist by joining its advisory or technical committees. Prof. Leschziner commented that ERCOFTAC could not be involved at an institution level, but that he would write to SPC members and encourage them to contact the advisory committee of the symposium as individuals in order to introduce a European perspective into this joint EU-US event.

### **ii. Pan-European laboratory of non-homogenous turbulence**

Prof. Redondo gave a short presentation on his proposal to create a 'Pan-European laboratory of non-homogenous turbulence'. This network of European laboratories would coordinate and focus their research activities by sharing their resources and equipment. He noted that the involvement of ERCOFTAC would be very beneficial to the success of this project by helping it secure funds and by providing visibility.

*\* The SPC voted to endorse Prof. Redondo's proposal to create a 'Pan-European laboratory of non-homogenous turbulence'.*

## **11. Dates and location of the next SPC meeting**

The next SPC meeting will be held at TU Delft on the 18<sup>th</sup> May 2010.

Navid Borhani  
Lausanne, 2009.

# European Research Community On Flow, Turbulence And Combustion

## MINUTES

### INDUSTRIAL PROGRAMME COMMITTEE (IPC)

EPFL, Lausanne, October 2<sup>nd</sup> 2009

#### Attendance

Charles Hirsch	NUMECA International
Anthony Hutton	Airbus UK
Rene Oliemans	Multiphase Flow B.v.
Chris Lea	Lea CFD Associates Ltd
Wolfgang Rodi	KIT
Richard Seoud	ERCOFTAC
Sedat Tardu	LEGI

The meeting was formally opened at 09-00 by Chris Lea - IPC Chairman, who also took the minutes.

The main actions are underlined below.

#### 1. Apologies for absence

None received.

#### 2. Approval of the agenda

Approved without comment.

#### 3. Minutes of IPC meeting held in Budapest on 5<sup>th</sup> May 2009

The minutes of the IPC meeting in Budapest on 5<sup>th</sup> May 2009 were circulated and agreed without comment.

#### 4. ERCOFTAC Industrial strategy

##### *i. Recap on the aims and objectives of the strategy*

Chris Lea reiterated the objectives of the original business plan. This being a four year plan to enhance engagement with industry and, in particular, aiming to grow the industrial membership. This was to be achieved by offering products/services, such as courses/seminar/BPG, on preferential terms to members, whilst also offering these products/services to non-members. The plan is being delivered by Dr Richard Seoud, ERCOFTAC's Industry Engagement Officer, and is still in its early stages as Richard was only recruited in April 2008. A key objective is the generation of sufficient surplus to cover employment costs, leading to cost recovery in the fourth year.

##### *ii. Development and agreement of the forward programme of events*

Richard Seoud had prepared a presentation on his efforts to implement ERCOFTAC's business plan. Unfortunately a projector was not available at short notice to display the presentation and neither were any hardcopies available.

The ensuing discussion focused on Richard's progress in developing the forward programme of events for 2010. The following decisions and actions were agreed:

(PTO)

- It was agreed that it was unrealistic to expect Richard to develop the detailed scope and content of courses and seminars. Instead, Scientific Coordinators were identified and assigned to lead development of the scope and content of five key events for 2010:
  - Hybrid RANS-LES Methods for Industrial CFD course: **Dr Charles Mockett**
  - Best Practice for Engineering CFD course: **Dr Chris Lea**
  - Flow control – technical awareness seminar: **Prof Jim Morrison**
  - Error analysis and Uncertainty in CFD: **Prof Charles Hirsch**
  - Course based on Multi-Phase Flow BPG\*: **Prof Bernard Geurts**

All of the above activities are to be two-day events.

\*This course to be developed in collaboration with SIAMUF.

- It was agreed that **Richard** should construct and implement a plan to ensure the effective delivery of these events. **Richard** should submit the plan to the Executive Committee (EC) for approval, prior to implementation.
- Prof Hirsch proposed that, in future, **Richard** must bring a draft of the plan of events for the following year, to the Spring Festival - for discussion and refinement by the IPC & EC, such that by the Autumn Festival the plans can be finalised. Richard should develop this plan by seeking ideas and input from SIGs.
- It was agreed, in principle, that events could be held outside of the EU, for example in the United States. The Hybrid RANS-LES course was seen as being a suitable candidate.
- It was agreed that **Richard** must, as a matter of urgency, seek to significantly increase the size of the e-mail list he uses to advertise events, from 'several hundreds' to 'several thousands'.
- Prof Hirsch offered to provide Richard with an introduction to the VKI Director for assistance in advertising ERCOFTAC events, asking that **Richard** write to Charles with a formal letter requesting such assistance.
- Prof Rodi proposed that the phrase 'world leader' be dropped from advertising material for ERCOFTAC industrial events, as this was perceived as being a rather arrogant claim. This proposal was approved.

### **iii. IEO support assistant (IEOSA)**

Chris Lea presented a written case for engagement of a part-time assistant to support Richard Seoud. This case is appended to these minutes.

The level of support is to be equivalent to one week per month at a cost of €500 per month from January 2010 and at half this rate in the preceding quarter year. The IEOSA will report directly to the IEO who will manage their day-to-day activities. The IEO is to submit a report to the ERCOFTAC Executive Committee every three months on the work carried out and the value derived. This report will be validated by the chair of the IPC before submission to the Executive Committee.

This proposal was agreed. Furthermore, it was agreed that Sarah Hutton, who has much previous experience of ERCOFTAC due to her work on the QNET-CFD Wiki, would be very suitable for this post. These decisions were put forward for approval by the Managing Board later the same day.

- Chris Lea to draft a formal contract for Sarah Hutton's engagement by ERCOFTAC, based on that which exists for David Ellacott.

## 5. QNET-CFD Wiki

The current status of the Wiki was presented by Prof Rodi.

The following actions were agreed:

- Prof Rodi offered to explore with Springer the possibility of placing an advertisement for the Wiki in "Flow, Turbulence and Combustion".
- Prof Hutton agreed to explore the possibility of a 'banner-ad' on CFD On-line for the Wiki, as well as other means of enhancing the profile of the Wiki on this web-site.

## 6. Best Practice Guidelines (BPG)

### (i) Dispersed Multi-Phase Flow BPG

- It was agreed that this BPG should be provided free to new and existing members of ERCOFTAC.
- It was agreed that Sarah Hutton should develop a marketing plan for these BPG.

### (ii) Industrial CFD BPG, 2<sup>nd</sup> edition

This extract is from the minutes of the IPC meeting at the Spring Festival in 2009.

*"Production of a 2<sup>nd</sup> edition of the original BPG is still envisaged. The team comprises Dr Mark Savill (University of Cranfield), Dr Chris Carey (ANSYS Europe), Dr Chris Lea (Lea CFD Associates), Dr David Standingford (BAE Systems), Prof Dr Ernesto Casartelli (Lucerne University) and latterly Prof Hirsch (NUMECA). This effort was initially led by Tony Hutton, but due to volume of work this activity was taken over by Chris Lea."*

Chris Lea has been unable to dedicate the time which is required to this activity. However, he has confirmed with each of the above contributors that they would be willing to continue. Prof Hutton kindly agreed to take on this responsibility.

- Chris Lea to pass to Prof Hutton all draft material for the 2<sup>nd</sup> edition of these BPG.

### (iii) Other BPG

- It was agreed that Richard Seoud would seek a formal proposal for a BPG on combustion, from Ananias Tomboulides.
- Prof Hutton agreed to send a copy of the single-phase flow BPG to Ananias Tomboulides, for guidance.
- It was again agreed that discussions on the possibility of a BPG on heat transfer should continue by 'phone during forthcoming EC meetings.

## 7. Next IPC meeting

The next IPC meeting will be at TU-Delft, Tuesday 18<sup>th</sup> May 2010.

## **8. Any Other Business**

Chris Lea circulated notes of a brainstorming meeting hosted by BAE Systems on 25<sup>th</sup> September 2009 whose aim was 'Enhancing ERCOFTAC engagement with industry'. The notes are appended to these minutes. These notes consist of ideas for discussion, rather than firm proposals for action. Two actions were agreed following a brief review of these notes:

- It was agreed, in principle, to develop and host a twice-yearly webinar on cutting-edge topics in fluid dynamics, with high-profile speakers, so as to raise awareness of ERCOFTAC.
- To stimulate industrial\* membership of ERCOFTAC, it was agreed that new industrial\* members would be able to offset the cost of one attendance at an industrial event against fees for the first year of their membership.

\*Subsequently, at the Managing Board meeting later that day, this proposal was amended and agreed as follows:

"To stimulate membership of ERCOFTAC, it was agreed that all new members will be able to offset the cost of one attendance at an industrial event against fees for the first year of their membership."

Meeting closed at 12-00.

Chris Lea  
April 2010



## **IEO Support Assistant (IEOSA)**

ERCOFTAC's Industrial Engagement Strategy and Business Plan made provision for part-time secretarial support for the IEO. The activities of the IEO have gradually expanded and the work-load has increased to a point where support is now necessary for the continued implementation of the business plan. In particular, the IEO needs support in the early planning and subsequent promotion of events, services and products. In line with the IEO's end-of-year review (agreed up to ¼-time secretarial support), it is proposed that a modest level of support be provided so that the IEO can concentrate on outreach and delivery of events/services/products. The role of the proposed Support Assistant will, however, stretch beyond just secretarial support.

### **Roles and responsibilities**

#### **a) Market Research**

The IEOSA will support the IEO in carrying out market research to identify those specific events/services/products which are likely to be well received and to test reaction to those that are planned before significant investment is committed. This role will extend to the preparation and distribution of questionnaires and surveys, telephone interviews with prospective customers, processing of responses, and other initiatives as requested by the IEO.

#### **b) Event/Services/Product Publicity**

The IEOSA will prepare and distribute letters, e-mails, and assist in the preparation of other communications such as news and awareness articles for publication on the website, in the Bulletin and other platforms, as requested by the IEO. This role will extend to the preparation of announcement flyers and calls to participate in forthcoming events.

#### **c) General marketing support**

The IEOSA will assist in the preparation of more general publicity material designed to raise awareness of ERCOFTAC and its industrial activities.

#### **d) QNET-CFD Wiki**

It is envisaged that the Wiki activity and interaction with the world community may grow rapidly. Experience to date indicates that this will generate operational issues and problems which will place an undesirable burden on the editor and technical support officer. The IEOSA will coordinate the response to these issues and their practical solution (e.g. contributor enquiries/operational difficulties, evolution of the Wiki operational model in the light of experience etc.) working through the editor, the technical support officer and as advised by the IEO.

(PTO)

## **Management of IEOSA**

The IEOSA will report directly to the IEO who will manage their day-to-day activities.

The IEO will submit a report to the ERCOFTAC Executive Committee every three months on the work carried out and the value derived. This report will be validated by the chair of the IPC before submission to the Executive Committee.

## **Remuneration**

The original business plan made provision for up to half-time secretarial support, although it was believed that this could probably be significantly reduced. Nevertheless, the financial modelling was undertaken on this basis and at an estimated annual cost of up to €1k plus up to 35% social costs.

To keep costs under control and financial risks low, it is proposed that the support be provided at a lower cost, broadly equivalent to half-a-week per month for the first quarter, rising to about one week per month thereafter - subject to the further agreement of the Executive Committee. This would be delivered under contract to ERCOFTAC with remuneration of €250 per month over the first quarter, rising to €500 per month in subsequent quarters, payable monthly in arrears.



## **Brainstorming meeting**

**“Enhancing ERCOFTAC engagement with industry”**

**25<sup>th</sup> September 2009, BAE Systems**

### **Attendees:**

Tony Hutton, Chair ERCOFTAC.  
Chris Carey, ANSYS & previous UK PC Coordinator  
David Standingford, BAE Systems & UK PC host  
Richard Seoud, IEO  
Chris Lea, Chair IPC  
Iain Barton, BAE Systems & UK PC Coordinator

**Main outcomes – to be further developed** (in no particular order)

### **a) E-learning packages**

- E-learning packaging of Best Practice Courses, etc.
- Potential for world-wide engagement.
- Medium-term prospect, i.e. 3 years to be fully up and running.
- Must be professionally hosted.
- CFMS have offered to host this service.
- NAFEMS report success in this area.

### **b) Technology Awareness seminar**

- Expand out over two days.
- “Uncertainty in CFD: Identification, Quantification and Management”. Significant potential for such an event.
- “Meshless Methods”, “Complex Heat Transfer”, “Turbulence Simulation”. Potential topics for further events, but need to be market-tested before further commitment.
- Possibility of joint two-day events spanning two topic areas.
- Need to ensure that marketing material is very clear as to what delegates will obtain from these seminar.

### **c) Best Practice Guidance courses/lecture series**

- “Aero-acoustics”, “Flow control”, “Basic LES”. Potential topics for further events, but need to be market-tested before further commitment.
- ?SIG coordinators to act as course directors?

### **d) Event delivery beyond current locations**

- Firstly, confirmation that Germany and Scandinavia should continue as locations for events, and not the UK.
- France should be a fertile location. ANSYS see good attendance at events in France. However, the exact location needs to be tailored to the likely audience, i.e. Toulouse for aerospace, etc.



- To test the water in the USA, with the Hybrid RANS-LES course, linked to the new membership from Boeing and their interest in setting-up a US PC. Must ensure some home-based speakers are involved, ?Spalart?.

#### **e) Advertising**

- Planning period and advertising for events depends on target audience. Low-level employees require far-greater notice than more senior staff.
- Strong steer to avoid paid-for advertising in traditional journals, e.g. Professional Engineering. Expensive and with a very poor record of response.
- Targeted e-mail, hardcopy flyers and telephone follow-ups should be the main outlets for advertising efforts so as to obtain the best returns.
- ?Try e-mails with “Meeting invite” as the subject, rather than the actual title?
- Take-up banner ad on CFD-Online, at £200-£300/yr.

#### **f) Industrial membership**

- To stimulate take-up of new industrial memberships, offset 1<sup>st</sup> year membership fees against event fees.
- Direct debit option for memberships – to help ensure that memberships are renewed?

#### **g) Webex and webinar**

- Develop webinar versions of event lectures, offered at modest fee for non-members, free to members.
- Develop Webex-based versions of events and courses, to allow interaction and feedback for non-travelling participants.

#### **h) Profile-raising**

- Series of high-profile webinars, free to members, modest fee to non-members, held bi-yearly.
- “Climate change: Geo-engineering challenges for fluid mechanics”, ?Brian Launder?
- ITER, Richard Seoud contact.
- “Meeting the CO<sub>2</sub> reduction challenge: Paradigms shifts in the aerospace industry”, ?Ian Poll?
- “Alternative energy sources and fluid mechanics challenges” ?John Loughhead?.

#### **i) Other considerations**

- ERCOFTAC’s industrial strategy should focus on ‘the new stuff’, rather than disseminating existing low-level guidance and advice - for which the market-place is quite crowded.

# *European Research Community On Flow, Turbulence and Combustion*

## **MANAGING BOARD MEETING**

**2<sup>nd</sup> October 2009, Lausanne, Switzerland**

### **ATTENDANCE**

Borhani, N.  
Braza, M.  
Cambon, C.  
da Silva, C.  
Geurts, B.J.  
Gromke, C.  
Hämäläinen, J.  
Hirsch, C.  
Hutton, T.  
Jakirlic, S.  
Lea, C.  
Leschziner, M.  
Nowakowski, A.

Oliemans, R.  
Ooms, G.  
Quack, M.  
Redondo, J.  
Reichl, C.  
Rodi, W.  
Seoud, R.  
Sommerfeld, M.  
Tardu, S.  
Tomboulides, A.  
Van Steenhoven, A.  
Vlachos, N.  
Von Terzi, D.

### **APPOLOGIES**

Castilla, R.  
Gauger, N.  
Geuzaine, P.  
Hanifi, A.  
Hunt, J.

Koumoutsakos, P.  
Thome, J.  
Violeau, D.  
Von Rohr, P.  
Wallin, S.

## SUMMARY OF ITEMS ARISING FROM THE MEETING

- *The Managing board voted that non-European organisations could join ERCOFTAC directly rather than through a national Pilot Centre.*
- *The rights of such non-European members to sit on the Managing Board will be reviewed by the Executive Committee and presented at the Spring ERCOFTAC meeting in Delft.*
- *The ERCOFTAC by-laws need to be modified to allow non-European members.*
- *The Managing Board approved the hiring of Ms. Hutton, on a one week per month basis at a rate of 500 Euros per month, to assist Dr. Seoud in the marketing and research of events and to support the QNET-CFD Knowledge Base.*
- *Dr. Borhani will write to all of the Pilot Centre Coordinators asking for one research and one industrial representative for the year 2011. These will then be approved by the Managing Board and General Assembly at the Autumn ERCOFTAC committee meetings in 2010.*
- *The SPC will comprise the research and industrial representatives of each Pilot Centre, and the SIG Coordinators.*
- *The nature of the IPC will be considered by the Executive Committee and discussed during the Spring ERCOFTAC meeting in Delft.*
- *The Managing Board voted to appoint Dr. Lea as the ERCOFTAC Webmaster at a rate of 4000 Euros per year.*
- *The Managing Board voted to appoint Prof. Rodi to the new position of Knowledge Base Editor on the Executive Committee.*
- *The Managing Board voted that the table of contents of all issues and the editorials of themed issues be made freely available on the ERCOFTAC website to all. However, the full Bulletin will only be made available online to members.*

## MINUTES

The meeting was opened by the ERCOFTAC Chairman, Prof. Hutton, at 14:00.

### **1. Approval of the agenda**

The agenda was approved.

### **2. Approval of minutes from the Executive Committee meetings held in Budapest on the 5.5.2009**

The minutes were approved.

### **3. Action items from the Committee meetings held in Budapest on the 5.5.2009**

These will be addressed below.

## **4. The evolution of ERCOFTAC and its future operation**

### **i. Membership by non-European Organisations**

Prof. Hutton stated that ERCOFTAC now invites organisations outside of Europe to become members. He reported that Boeing had become the first non-European member of ERCOFTAC, having subscribed to a multi-site membership. Prof. Hutton also urged members to contact their non-European colleagues to promote more members. He added that the Executive Committee suggests such organisations may join directly rather than going through a Pilot Centre. They may then germinate their own national Pilot Centres at a later date if they wished.

*\* The Managing board voted that non-European organisations could join ERCOFTAC directly rather than through a national Pilot Centre.*

*\* The rights of such non-European members to sit on the Managing Board will be reviewed by the Executive Committee and presented at the Spring ERCOFTAC meeting in Delft.*

*\* The ERCOFTAC by-laws need to be modified to allow non-European members.*

### **ii. EC-AERO and its implications for ERCOFTAC**

Prof. Hirsch gave a summary of ERCOFTAC's involvement in the European Commissions' EC-AERO proposal to coordinate the dissemination of scientific information in the field of aeronautics. The aim of this proposal is to minimise the overlap between such courses and activities. Partners in the EC-AERO proposal include: ECCOMASS, ERCOFTAC, CEAS, EUCASS, EUROMECH and EUROTURBO. Of the present 750k Euros EC-AERO budget, around 80k Euros has been assigned to ERCOFTAC for manpower costs and the support of ERCOFTAC activities. EC-AERO is currently promoting joint activities by these organisations to show if they can work together, these activities include: joint ERCOFTAC-EUROMECH summer schools, and joint ERCOFTAC-CEAS industrial days. He reported that there was a kick-off meeting held in Barcelona on the 28<sup>th</sup> September 2009 which Dr. Seoud attended. Dr. Seoud then reported a number of proposals resulting from this meeting: i) the creation of an EC-AERO website to advertise the activities of all of the consortium members, ii) a common registration form and payment system for all of the activities related to the consortium members, iii) the harmonisation of activities such as summer schools and conferences, iv) collaboration in the creation of future Best Practice Guidelines on a number of subjects, and v) the creation of databases for the validation of numeric codes. Furthermore, as part of these proposals, Dr. Seoud will be submitting a report in 11 months time to EC-AERO on how the consortium members are presently advertising and disseminating information from their events. After discussions, the Managing Board urged that care should be taken in not undermining the present operations of ERCOFTAC through this consortium.

## **5. Election of new Managing Board members**

The Managing Board unanimously elected the following:

- Prof. Hirsch as the ERCOFTAC 2<sup>nd</sup> Deputy Chairman.
- Prof. Geurts as the ERCOFTAC SPC Chairman: approved unanimously.
- Prof. Leschziner as the ERCOFTAC SPC Deputy Chairman for one more year, until another candidate can be identified for the position with the intention that they should step up to SPC Chairmanship at a future date.

## **5. Financial report**

Prof. Hirsch reported that to date in 2009 there was an income of around 113k Euros from membership fees, 6k Euros from BPGs, and 9k Euros from ETMM8. Total expenses to date are around 90k Euros, this includes a cost of 8k Euros for the upgrade of the website. He added ERCOFTAC has total current assets of around 410k Euros of which 370k Euros is cash and 40k Euros is accounts receivable.

## **6. Report from the Administration and Development Office**

Prof. Hirsch reported that the ADO was keeping track of the late payment of membership fees.

## 7. Report from the Coordination Centre

Dr. Borhani reported that the Coordination Centre was not seeking an increase in funding for 2010.

## 8. Report from the Scientific Programme Committee

### i. SIG funding requests

Based on the recommendation of the SPC, the Managing Board voted to fund a further four SIGs for up to 3000 Euros during 2010. These SIGs were:

- SIG 20 *Drag reduction and flow control*
- SIG 28 *Reactive flows*
- SIG 35 *Multipoint turbulence structure and modelling*
- SIG 42 *Synthetic models in turbulence*

Requests for reimbursements by these funded SIGs should be made to the ERCOFTAC ADO in Brussels. For invoiced items, the ADO should be provided with receipts, a short justification, and bank details. All reimbursement requests will be audited by the ADO before payment.

### ii. Workshop and summer school funding requests

Based on the recommendation of the SPC, the Managing Board approved the following actions regarding sponsorship of future events:

- W2009-11** '*Research in turbulence and transition*', Lisbon, Portugal, 16.10.2009.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 2000 Euros was awarded.
- W2009-12** '*Turbulent flows – Velocity gradients and increments*', Ecully, France, 4-5.12.2009.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 2000 Euros was awarded.
- W2010-01** '*Workshop on fibre suspension flows*', Stockholm, Sweden, 9-10.2.2010.  
Application for use of the ERCOFTAC logo was approved.
- W2010-02** '*MUSAF colloquium*', Toulouse, France, 27-29.9.2010.  
Application for use of the ERCOFTAC logo was approved.
- W2010-03** '*European drag reduction and flow control meeting*', Kiev, Ukraine, 6-9.9.2010.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 2000 Euros was awarded.
- W2010-04** '*Advances and applications of GiD*', Ibiza, Spain, 25-27.5.2010.  
Application for use of the ERCOFTAC logo was rejected.  
Application for funding was rejected.
- W2010-05** '*Two-phase flow predictions*', Halle, Germany, 22-26.3.2010.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 2000 Euros was awarded.
- W2010-06** '*Dynamics of non-spherical particles in fluid turbulence*', Trondheim, Norway, 29.9.2010.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 2000 Euros was awarded.
- S2010-01** '*PIV course*', Gottingen, Germany, 22-26.3.2010.  
Application for use of the ERCOFTAC logo was approved.  
Application for funding was rejected.
- S2010-02** '*Non-normality and non-linearity in thermo-acoustics*', Munich, Germany, 17-21.5.2010.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 3000 Euros was awarded.
- S2010-03** '*Turbulence and mixing in compressible flows*', Oléron Island, France, 13-18.9.2010.  
Application for use of the ERCOFTAC logo was approved.  
A scholarship of 3000 Euros was awarded.

**S2010-04** *'New challenges in turbulence research'*, Les Houches, France, 21-26.2.2010.

Application for use of the ERCOFTAC logo was approved.

A scholarship of 3000 Euros was awarded.

### **iii. Status of SIGs**

The SPC voted to close SIG 101 *Quality and trust in industrial CFD*. Managing Board members urged greater effort in reactivating SIG 39 *Aeroacoustic* and SIG 34 *Design optimisation*.

## **9. Report from the Industrial Programme Committee**

Dr. Lea reported on the implementation of ERCOFTAC's business plan by Dr. Seoud. Three events have been scheduled for 2009, namely: a one day seminar based on the new dispersed multiphase flow BPG, a one day event on the subject of 'New technologies in micro-heat transfer', and a two day course on 'Hybrid RANS and LES methods'. At least five events are planned for 2010, including repeats of events held in 2009. In order to promote ERCOFTAC internationally, a 'Hybrid RANS and LES methods' course could be held in the USA. Other planned events for 2010 include: a 2 day course on 'Best practice in industrial CFD', a two day event on 'Flow control', and a two day course on 'Error analysis and uncertainty in CFD'. Dr. Lea then suggested that new industrial and academic members of ERCOFTAC should be allowed to offset registration fees for such events against their first year membership fees. Prof. Hutton then suggested that the profile of ERCOFTAC can be further enhanced by organising a series of bi-annual web based ERCOFTAC lectures by senior members of the community.

Dr. Lea proposed to the Managing Board that additional marketing and research manpower was required to ensure the success of events organised by Dr. Seoud.

*\* The Managing Board approved the hiring of Ms. Hutton, on a one week per month basis at a rate of 500 Euros per month, to assist Dr. Seoud in the marketing and research of events and to support the QNET-CFD Knowledge Base.*

## **11. Composition of the SPC, IPC and MB**

Dr. Borhani indicated that the membership of the SPC, IPC and MB needs to be clarified. The Management Board agreed that:

*\* Dr. Borhani will write to all of the Pilot Centre Coordinators asking for one research and one industrial representative for the year 2011. These will then be approved by the Managing Board and General Assembly at the Autumn ERCOFTAC committee meeting in 2010.*

*\* The SPC will comprise the research and industrial representatives of each Pilot Centre, and the SIG Coordinators.*

*\* The nature of the IPC will be considered by the Executive Committee and discussed during the Spring ERCOFTAC meeting in Delft.*

## **12. Status of ERCOFTAC products and services**

### **i. ERCOFTAC Website**

Dr. Lea gave a presentation of the new ERCOFTAC website which is currently under beta testing. He reported that it should be online by the end of the year. The Managing Board suggested that only ERCOFTAC members should have access to the SIG discussion forums on the website. Dr. Lea then indicated the need for a webmaster to manage the layout and content of the new website.

*\* The Managing Board voted to appoint Dr. Lea as the ERCOFTAC Webmaster at a rate of 4000 Euros per year.*

## **ii. QNET-CFD Knowledge Base**

Prof. Hutton indicated the importance of the newly refurbished QNET-CFD Knowledge Base to the future of ERCOFTAC. He commented on the need for a new position on the Executive Committee charged with overseeing this project.

*\* The Managing Board voted to appoint Prof. Rodi to the new position of Knowledge Base Editor on the Executive Committee.*

## **iii. ERCOFTAC Bulletin**

Dr. Borhani commented on the need to reduce the operation and the postage costs of the Coordination Centre. He reported that, after discussions with the Executive Committee, it had been decided that in the future only a single printed copy of the ERCOFTAC Bulletin will be posted to member organisation, with extra printed copies being available at an additional cost. However, free electronic copies will be made available for download from the ERCOFTAC Website by member organisations. Non-members will be able to buy printed copies of the Bulletin. The Managing Board then discussed if the Bulletin should be made available freely online to both members and non-members.

*\* The Managing Board voted that the table of contents of all issues and the editorials of themed issues be made freely available on the ERCOFTAC website to all. However, the full Bulletin will only be made available online to members.*

## **iv. ETMM8**

Prof. Leschziner reported that abstracts were still being received for ETMM8 even after the deadline. He said that the abstracts will be reviewed in January 2010. He also added that around twenty organisations had been approached for sponsorship, including the French Air force who had agreed to pay for the printing of the conference proceedings.

## **v. ERCOFTAC Best Practice Guidelines**

Prof. Hutton reported that he had taken over the creation of the second edition of the 'BPG on Industrial CFD'. Dr. Lea then said that around sixty copies of the new 'Dispersed multi-phase flows BPG' had been sold to date. He added that, in order to promote new membership, copies of both current ERCOFTAC BPGs will be made available free of charge to new ERCOFTAC members. Dr. Lea also indicated that Prof. Tomboulides was interested in creating a BPG on combustion.

## **13. Any other business**

The Managing Board expressed its thanks to Prof. Leschziner in appreciation of his efforts as SPC Chairman during the last four years.

## **14. Dates and location of the next EC meeting**

The next ERCOFTAC Spring Festival and Committee Meetings will be held at TU Delft on the 17-18<sup>th</sup> May 2010. The next ERCOFTAC Autumn Festival and Committee Meetings will be held in Lisbon on the 11-12<sup>th</sup> October 2010.

Navid Borhani  
Lausanne, 2009.

# *European Research Community On Flow, Turbulence and Combustion*

## **GENERAL ASSEMBLY MEETING**

**2<sup>nd</sup> October 2009, Lausanne, Switzerland**

The meeting was opened by the ERCOFTAC Chairman, Prof. Hutton, at 16:30.

### **1. Election of ERCOFTAC Officers and Management Board members**

The General Assembly voted anonymously to appoint:

- Prof. Hirsch as the ERCOFTAC 2<sup>nd</sup> Deputy Chairman: approved unanimously.
- Prof. Geurts as the ERCOFTAC SPC Chairman: approved unanimously.
- Prof. Leschziner as the ERCOFTAC SPC Deputy Chairman: approved unanimously.

### **2. Approval of the 2008 accounts**

The 2008 accounts were approved unanimously.

### **3. Approval of the 2009-10 budget**

The 2009-10 budget was approved unanimously.

Prof, Hutton closed the assembly at 16:40, and thanked those attending.

Navid Borhani,  
Lausanne, 2009.



## **ERCOFTAC 2011 SIG Funding Applications**

To be considered at the SPC meeting in Delft, 18<sup>th</sup> May 2010.

### **SIG**

- 12 Dispersed turbulent two-phase flows
- 20 Drag reduction and flow control
- 43 Fibre suspension flows

## Application for financial support in 2011

<b>SIG 12</b>	<b>Turbulent dispersed Two-Phase Flows</b>
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<b>Past activities (2008 - 2010):</b>	<p>ERCOFTAC Summerschool: Modelling of Atomisation and Sprays for Technical and Industrial Applications, Martin-Luther-Universität Halle-Wittenberg, Halle (Saale), Germany, July 2008</p>
	<p>Completion of the Best Practice Guidelines for Computational Fluid Dynamics of Dispersed Multiphase Flows. ERCOFTAC European Research Community on Flow, Turbulence and Combustion (Eds. Sommerfeld, van Wachem and Oliemans), Oct. 2008</p>
	<p>Introduction of the BPG for dispersed multi-phase flow at the Italian ERCOFTAC pilot centre, Florence, 16<sup>th</sup> October 2009</p>
	<p>Preparation of a theme issue for the ERCOFTAC Bulletin until March. 2010 (Title: Dispersed Multiphase Flow: From Micro-Scale to Macro-Scale Numerical Modelling) with 12 contributions</p>
	<p>12<sup>th</sup> Workshop on Two-Phase Flow Predictions (presentations and test case calculations), Martin-Luther-Universität Halle-Wittenberg, Halle (Saale), Germany, March 2010</p>

<b>Future activities in 2010/2011</b>	<p>Introduction of the BPG for dispersed multi-phase flow at the ERCOFTAC Nordic Pilot Centre, Stockholm, 27<sup>th</sup> – 28<sup>th</sup> October 2010</p>
	<p>Further extension and documentation of the multiphase flow test case data base, e.g. dense particle-laden jet and swirling flow (<a href="http://www-mvt.iw.uni-halle.de/english/index.php?test_cases">http://www-mvt.iw.uni-halle.de/english/index.php?test_cases</a>)</p>
	<p>Preparation of a joint publication on the test case “Dense particle-laden free jet with different solids loading” introduced at the 12<sup>th</sup> Workshop on Two-Phase Flow Predictions (measurements: Prof. Sinclair Curtis, University of Florida, USA)</p>
	<p>ERCOFTAC Summerschool on modelling of bubbly flows: Recent developments and future needs (location and date to be defined)</p>

The SIG-Concordat established at the London meeting on 16th June 2006 is accepted.

Merseburg, 27. April 2010

Location, Date



## **Request for SIG funding in 2011**

Kwing-So Choi  
Convenor, **SIG20** (Drag Reduction and Flow Control)

### *(i) A statement of activities over the past two years*

**FLOW-ERCOFTAC Summer School in Flow Control and Optimization** took place at KTH, Sweden between 29 June and 3 July 2009. The topics included are introduction to hydrodynamic stability; optimal and feedback control; numerical and experimental methods in flow control; model reduction, design, optimisation and application to fluid-flow systems.

**Workshop on Flow Control Methods and Applications** was held at the University of Poitiers, France on 7-11 December, 2009, providing lectures on the theoretical background on flow control methods and the laboratories on real-world applications.

### *(ii) A plan of activities for the years 2010/11, with particular emphasis on any initiatives designed to expand the SIG.*

**European Drag Reduction and Flow Control Meeting (EDRFCM 2010)** will take place in Kiev, Ukraine on 2-4 September 2010. We are expecting many participants from EU countries as well as USA, Russia, Ukraine, Japan and China. Research presentations and discussions will be made on the following subjects.

- Drag reduction using additives
- Flow control over bluff bodies
- Boundary layer control
- Optimal flow control
- Magneto-hydrodynamics
- Plasma flow control
- Drag reduction by structured surfaces

**ERCOFTAC Technology Awareness Seminar on Flow Control Technologies** will be held in the University of Twente, The Netherlands in 2010, where the latest developments in flow control theories and applications will be discussed.

We plan to work with other research organisations such as EUROMECH, with a view to have joint meetings and workshops. This will help expand the ERCOFTAC membership base, particularly in drag reduction and flow control research areas.

### *(iii) A statement on input to the ERCOFTAC website, highlighting the up-to-date nature of the information contained in the SIG's webpage.*

SIG20 has collaborated with Dr Chris Lea on the development of new ERCOFTAC Website, by providing necessary information and pictures on our SIG.

### *(iv) A commitment to the Concordat.*

SIG20 is committed to the Concordat.



*European Research Community on Flow, Turbulence and Combustion*  
*Special Interest Group on Fibre suspension flows – SIG43*

## **FUNDING APPLICATION TO ERCOFTAC**

SIG43 on Fibre suspension flows would like to apply ERCOFTAC support of *3000 euros* to be used in 2011. The support is needed for travelling costs to SIG43 meetings (workshops and other meetings) and to the ERCOFTAC SPC meetings twice a year.

Jari Hämäläinen,

22<sup>nd</sup> April, 2010



*European Research Community on Flow, Turbulence and Combustion*

## **Special Interest Group on Fibre suspension flows – SIG43**

### **Action report**

Here are mentioned all the concrete actions SIG43 has been responsible for since the establishment of the group (upcoming actions in blue):

- 2011
  - ❖ 3<sup>rd</sup> workshop on fibre suspension flows, April 27-28, 2011, Nancy, France (local organizer: Salaheddine Skali-Lami)
- 2010
  - ❖ Joint conference with EUROMECH (Helge Andersson, Alfredo Soldati)
  - ❖ Theme bulletin on fibre suspension flows (eds. Jari Hämmäläinen, Fredrik Lundell)
  - ❖ Participating the ERCOFTAC SPC meeting, May 17-18, Delft (Bendiks Jan Boersma)
  - ❖ SIG43 2<sup>nd</sup> workshop report in ERCOFTAC bulletin, submitted in March
  - ❖ 2<sup>nd</sup> workshop on fibre suspension flows, February 9-10, 2010, Stockholm, Sweden (local organizer: Fredrik Lundell)
- 2009
  - ❖ SIG43 1<sup>st</sup> workshop report in ERCOFTAC bulletin 81, December 2009
  - ❖ Participating the ERCOFTAC SPC meeting, October 1-2, Lausanne. Jari gave a presentation on fibre suspension flows
  - ❖ ERCOFTAC SIG43 group created in LinkedIn to have a discussion forum for all interested persons from the member organizations
  - ❖ Organizing several sessions on fibre suspension flows in PRS2009, June 1-4, 2009, Kuopio, Finland
  - ❖ Participating the ERCOFTAC SPC meeting, May 4-5, 2009, Budapest
  - ❖ Researcher visit from Częstochowa University of Technology, Poland to University of Kuopio, Finland (3+3 months in 2009)
  - ❖ 1<sup>st</sup> workshop on fibre suspension flows, April 2-3, 2009, Jyväskylä, Finland (local organizer: Juha Salmela)
- 2008
  - ❖ Participating the ERCOFTAC SPC meeting, November 20, Brussels
  - ❖ Steering group meeting, November 19, 2008, Brussels
  - ❖ SIG43 was presented in ERCOFTAC bulletin 77, 2008
  - ❖ SIG43 presentation at Nordic PC (NPC12) meeting given by Jari Hämmäläinen, May 29-30, 2008, Stockholm, Sweden

## Members (updated)

- New members to *SIG43 and ERCOFTAC*
  - ❖ Prof. Markku Kataja, Dep. of Physics, Univ. of Jyväskylä, Finland, 2009
  - ❖ Prof. M. Graça Rasteiro, Chem. Eng. Dep., FCTUC, Portugal, 2009
  - ❖ Dr. Salaheddine Skali-Lami, University of Nancy, France, 2009
- New members to *SIG43* (already ERCOFTAC members)
  - ❖ Fredrik Innings, TetraPak, Sweden, 2010
  - ❖ Prof. Srdjan Sasic, assistant professor, Division of Fluid mechanics, Department of Applied Mechanics, Chalmers, Sweden, 2009
  - ❖ Prof. Alfredo Soldati, Dr. Stella Dearing, Lab. for environmental and process fluid flow, University of Udine, Italy, 2009
- Original group of members
  - ❖ Darek Asendrych, Czestochowa University of Technology, Poland
  - ❖ Bendiks Jan Boersma, Delft University of Technology, The Netherlands
  - ❖ Thanasis D. Papathanasiou, University of Thessaly, Greece
  - ❖ Salaheddine Skali-Lami, University of Nancy, France (joining ERCOFTAC)
  - ❖ Roland Zelm, Technische Universität Dresden, Germany
  - ❖ Jari Hämäläinen, University of Kuopio, Finland
  - ❖ Hannu Eloranta, Tampere University of Technology, Finland
  - ❖ Fredrik Lundell, Royal Institute of Technology (KTH), Sweden
  - ❖ Janne Poranen, VTT Technical Research Centre of Finland, Finland
  - ❖ Industry: Tomas Wikström, Metso Paper, Inc.

## Workshops &amp; Summerschools

Code	Title	Location	Dates	Report due	Bulletin	Organisers	Email addresses	Co-organisers	Funding Requested	Funding Decision	Logo Requested	Logo Decision	Reviewed
S2007-01	Small scale turbulence	Cargèse, France.	13/10/2007 - 25/10/2007	25/04/2008	75	Danaila, L.		PCs: France West SIGs: 4, 35	Yes	Yes, 3000	Yes	Yes	Athens, 10.2006
S2007-02	DLES of reacting and two-phase flows	Berlin, Germany.	01/09/2007 - 01/09/2007	01/03/2008	75	Thevenin, D. Tomboulides, A.		SIGs: 28	Yes	Yes, 3000	Yes	Yes	Athens, 10.2006
S2008-01	Int. ss. on turbulence, plankton and marine snow	Vilanova, Spain.	01/09/2008 - 05/09/2008	05/03/2009	79	Clercx, H.	h.j.h.clercx@tue.nl	SIGs: 37 Co: JM Burgers Center, Lille University, Spanish Ministry of Science and Education, CNRS, AGAUR.	Yes	Yes, 3000	Yes	Yes	Athens, 10.2006
S2008-02	Application of PIV	Göttingen, Germany.	25/02/2008 - 29/02/2008	29/08/2008	77	Schröder, A.		PCs: North Germany, Netherlands, France. SIGs: 32	Yes	Yes, 3000	Yes	Yes	Brussels, 10.2007
S2008-03	JM Burgers Centre course on combustion	Eindhoven, Netherlands.	06/05/2008 - 09/05/2008	09/11/2008	79	de Goey, L.P.H. Roekaerts, D.	l.p.h.d.goey@tue.nl dirkr@ws.tn.tudelft.nl	SIGs: 28	Yes	Yes, 3000	Yes	Yes	Brussels, 10.2007
S2008-04	Modem applications of combustion technology	Nürnberg, Germany.	25/02/2008 - 28/02/2008	28/08/2009	-	Dinkelacker, F. Leipertz, A.		SIGs: 28	No	-	Yes	No	Brussels, 10.2007
S2008-05	Modelling of atomisation and sprays	Halle, Germany.	21/07/2008 - 24/07/2008	24/01/2009	79	Sommerfeld, M.	martin.sommerfeld@iw.uni-halle.de	PCs: Germany North SIGs: 12	Yes	Yes, 3000	Yes	Yes	Brussels, 10.2007
S2008-06	Turbulence and mixing in compressible flows II	Marseille, France.	07/07/2008 - 12/07/2008	12/01/2009	79	Dussauge, J-P.	jean-paul.dussauge@polytech.univ-mrs.fr	PCs: France South SIGs: 4	Yes	Yes, 3000	Yes	Yes	Stockholm, 5.2008
S2008-07	LES simulation and application in aeroacoustics	Balatonfüred, Hungary.	31/08/2008 - 06/09/2008	06/03/2009	79	Lajos, T. Lohasz, M.	lajos@ara.bme.hu lohasz@ara.bme.hu	PCs: AHS SIGs: 1, 39 Co: COST ACTION P20 LES-AID_CFD.hu	Yes	Yes, 3000	Yes	Yes	Stockholm, 5.2008
S2009-01	Turbulent mixing and beyond	Trieste, Italy.	01/10/2009	01/04/2010	-	Abarzhi, S.I. Gauthier, S.	snezha@flash.uchicago.edu serge.gauthier@orange.fr	Co: NSF, AFSOR, EOARD, ICTP, ANL, CEA, LANL, DOE ASC, ILE, IIT.	Yes	No	Yes	No	Brussels, 11.2009
S2009-02	Summerschool in Flow Control and Optimization	Stockholm, Sweden.	29/06/2009 - 03/07/2009	03/01/2010	Rec.	Brandt, L. Hanifi, A.	luca@mech.kth.se ardeshir.hanifi@foi.se	SIGs: 33	Yes	Yes, 3000	Yes	Yes	Brussels, 11.2009
S2009-03	Bio-fluid mechanics	Eindhoven, Netherlands.	09/03/2009 - 14/03/2009	14/09/2009	79	van Steenhoven, A.A van de Vosse, F.N. Poelma, C.	a.a.v.steenhoven@tue.nl	PCs: JM Burgers Centre SIGs: 37	Yes	Yes, 3000	Yes	Yes	Brussels, 11.2009
S2010-01	PIV course	Göttingen, Germany	22/03/2010 - 26/03/2010	26/09/2010	-	Schröder, A.	andreas.schroeder@dlr.de	PCs: Germany North, Netherlands, France SIGs: 32 Co: AG Stab, Oldenburg University, Munich University	Yes	No	Yes	Yes	Lausanne, 10, 2009
S2010-02	Non-normality and non-linearity in thermo-acoustics	Munich, Germany	17/05/2010 - 21/05/2010	21/11/2010		Polifke, W. Zellhuber, M. Tomboulides, A.	polifke@td.mw.tum.de zellhuber@td.mw.tum.de ananiast@googlemail.com	SIGs: 28 Co: Marie Curie RTN AETHER	Yes	Yes, 3000	Yes	Yes	Lausanne, 10, 2009
S2010-03	Turbulence and mixing in compressible flows	Oléron Island, France.	13/09/2010 - 18/09/2010	18/03/2011		Comte, P.	Pierre.Comte@lea.univ-poitiers.fr	PCs: France West SIGs: 4, 35	Yes	Yes, 3000	Yes	Yes	Lausanne, 10, 2009
S2010-04	New challenges in turbulence research	Les Houches, France.	21/02/2010 - 26/02/2010	26/08/2010	R*	Bourgoin, M. Rousset, B. Pinton, J-F. Cambon, C.	mickael.bourgoin@gmail.com Claude.Cambon@ec-lyon.fr	PCs: France Henri-Bénard SIGs: 4, 35 Co: CNRS	Yes	Yes, 3000	Yes	Yes	Lausanne, 10, 2009
S2010-05	Fundamentals of microscale heat transfer	Lausanne, Switzerland.	07/06/2010 - 11/06/2010	11/12/2010		Thome, R.	John.Thome@epfl.ch		Yes		Yes		Delft, 5.2010
W2007-01	Quality & reliability of CFD simulations III	Nottingham, UK.	14/03/2007	14/09/2007	73	Lea, C.		PCs: UK SIGs: 5, 101	No	-	Yes	Yes	Florence, 5.2006
W2007-02	Micro PIV and applications in microsystems	Delft, Netherlands.				Lindken, R.		SIGs: 32, 38	Yes	Yes	Yes	Yes	Florence, 5.2006
W2007-03	Langrangian techniques in multiphase flow	Trieste, Italy.	05/09/2007 - 07/09/2007	07/03/2008	75	Kuerten, J.			Yes	Yes	Yes	Yes	Athens, 10.2006
W2007-04	Spheric II	Madrid, Spain.	01/05/2007	01/11/2007	73	Gomez-Gesteira, M. Souto Iglesias, A.		SIGs: 40	Yes	Yes	Yes	Yes	Athens, 10.2006
W2007-05	New developments in multipoint turbulence modelling	London, UK.	01/03/2007	01/09/2007	73	Cambon, C.		Co: COST	Yes	Yes	Yes	Yes	Athens, 10.2006
W2007-06	LES simulation for design of combustion systems	Rouen, France.	24/05/2007 - 25/05/2007	25/11/2007	73	Vervisch, L. Tomboulides, A.		Co: EC COST P20, GST	Yes	Yes	Yes	Yes	Athens, 10.2006

## Workshops &amp; Summerschools

Code	Title	Location	Dates	Report due	Bulletin	Organisers	Email addresses	Co-organisers	Funding Requested	Funding Decision	Logo Requested	Logo Decision	Reviewed
W2007-07	IUTAM: Unsteady separated flows and their control	Corfu, Greece.	18/06/2007 - 22/06/2007	22/12/2007	75	Braza, M.		PCs: France South Co: IUTAM	No	-	Yes	Yes	Athens, 10.2006
W2007-08	Laminar-turbulent transition mechanisms	Freudenstadt, Germany.	13/06/2007 - 15/06/2007	15/12/2007	75	Rist, U. Hanifi, A.		SIGs: 33	Yes	Yes	Yes	Yes	Athens, 10.2006
W2007-09	International gas turbine conference	Tokyo, Japan.	02/12/2007 - 07/12/2007	07/06/2008	-	Outa, E. Yoshino, T.		Co: ASME/IGTI. ...	No	-	Yes	No	Athens, 10.2006
W2007-10	Workshop on near wall turbulence	Viterbo, Italy.	22/03/2007 - 23/03/2007	23/09/2007		Stanislas, M.			No	-	Yes	Yes	Athens, 10.2006
W2007-11	Synthetic turbulence models	Sheffield, UK.	29/05/2007 - 30/05/2007	30/11/2007	75	Nicolleau, F.		PCs: France Henri Bénard, UK. SIGs: 1, 35	Yes	Yes	Yes	Yes	Berlin, 5.2007
W2007-12	Quality & reliability of LES	Leuven, Belgium.	24/10/2007 - 26/10/2007	26/04/2008	75	Meyers, J. Geurts, B.J. Sagaut, P.		SIGs: 1	Yes	Yes	Yes	Yes	Berlin, 5.2007
W2007-13	PAN-EUROPEAN lab on non-homogeneous turbulence	Vilanova, Spain.	29/11/2007 - 01/12/2007	01/06/2008	77	Redondo, J.M.		PCs: Iberian East, France Henri Bénard SIGs: 14, 35	Yes	Yes	Yes	Yes	Brussels, 10.2007
W2007-14	LES for combustion and transition modelling	Ghent, Belgium.	29/11/2007 - 30/11/2007	30/05/2008	79	Dick, E. Elsner, W.	erik.dick@ugent.be	SIGs: 10, 28	No	-	Yes	Yes	Brussels, 10.2007
W2008-01	ETMM7	Limassol, Cyprus.	04/06/2008 - 06/06/2008	06/12/2008	-	Leschziner, M.A. Kassinis, S.	mike.leschziner@imperial.ac.uk	Co: University of Cyprus	Yes	-	Yes	-	Florence, 5.2006
W2008-02	Spheric III	Lausanne, Switzerland.	04/06/2008 - 06/06/2008	06/12/2008	77	Maruzewski, P.	pierre.maruzewski@epfl.ch	SIGs: 1	Yes	Yes, 2000	Yes	Yes	Brussels, 10.2007
W2008-03	Sound source mechanisms in turbulent shear flows	Poitiers, France.	07/07/2008 - 09/07/2008	09/07/2008	Rec.	Jordan, P.	peter.jordan@lea.univ-poitiers.fr	PCs: France West	No	-	Yes	Yes	Brussels, 10.2007
W2008-04	DNS and LES of reacting flows	Eindhoven, Netherlands.	22/10/2008 - 24/10/2008	24/04/2009		de Goey, L.P.H.	l.p.h.d.goey@tue.nl	SIGs: 28 EC COST P20	Yes	No	Yes	Yes	Brussels, 10.2007
W2008-05	Quality & reliability of CFD simulations IV	Nottingham, UK.	05/03/2008	05/09/2008	79	Lea, C.	chris.leabuxton@btinternet.com	PCs: UK SIGs: 5, 101 Co: NAFEMS	Yes	Yes, 2000	Yes	Yes	Brussels, 10.2007
W2008-06	SIG33: Open issues in transition and flow control	Genova, Italy.	16/10/2008 - 18/10/2008	18/04/2009	79	Bottaro, A. Hanifi, A.	alessandro.bottaro@unige.it ardeshir.hanifi@foi.se	SIGs: 33	Yes	Yes, 2000	Yes	Yes	Brussels, 10.2007
W2008-07	European drag reduction and flow control meeting	Mariental, Germany.	08/09/2008 - 11/09/2008	11/03/2009	77	Hage, W. Wassen, E.	kwing-so.choi@nottingham.ac.uk wolfram.hage@dlr.de erik.wassen@cfdtu-berlin.de	SIGs: 20	Yes	Yes, 2000	Yes	Yes	Stockholm, 5.2008
W2008-08	DLES 7	Trieste, Italy.	08/09/2008 - 10/09/2008	10/03/2009	77	Armenio, V. Fröhlich, J. Geurts, B.J. ...	armenio@dica.units.it froehlich@ict.uni-karlsruhe.de b.j.geurts@math.utwente.nl	SIGs: 1	Yes	Yes*, 2000	Yes	Yes	Stockholm, 5.2008
W2008-09	Multiscale methods for fluid and plasma turbulence	Luminy, France.	21/04/2008 - 25/04/2008	25/10/2008	-	Schneider, K.	kschneid@cmi.univ-mrs.fr	PCs: France Henri Bénard SIGs: 35 Co: CNRS, CEA, ONR, Franco-Allemande Uni	Yes	No	Yes	No	Stockholm, 5.2008
W2008-10	13th. Workshop on turbulence modelling	Graz, Austria.	25/09/2008 - 26/09/2008	26/03/2009	79	Brenn, G. Jakirlic, S.	brenn@fluidmech.tu-graz.ac.at s.jakirlic@sla.tu-darmstadt.de	PCs: AHS SIGs: 15 Co: IAHR, COST	Yes	Yes, 2000	Yes	Yes	Stockholm, 5.2008
W2008-11	4th Workshop on synthetic turbulence modelling	Nancy, France.	11/12/2008 - 12/12/2008	12/06/2009	79	Angilella, J.R. Nicolleau, F.	jean-regis.angilella@ensem.inpl-nancy.fr f.nicolleau@sheffield.ac.uk	SIGs: 35, 42 PCs: France Henri Bénard	Yes	Yes*, 2000	Yes	Yes	Brussels, 11.2008
W2008-12	3rd. Workshop on synthetic turbulence models	Newcastle, UK.	03/07/2008 - 04/07/2008	04/01/2009	79	Nicolleau, F. Reeks, F. Baggaley, C. Cambon, C.	f.nicolleau@sheffield.ac.uk mike.reeks@newcastle.ac.uk a.w.baggaley@newcastle.ac.uk claudie.cambon@ec-lyon.fr	PCs: France Henri Bénard, UK. SIGs: 35, 42	Yes	Yes, 2000	Yes	Yes	Stockholm, 5.2008
W2009-01	Conference on turbulence and interactions	Martinique, France.	31/05/2009 - 05/06/2009	05/12/2009	Rec.	Deville, M.	michel.deville@epfl.ch	PCs: France Henri Bénard, Swiss SIGs: 4, 12, 14, 35, 39, 42 Co: EPFL, DGA, ONERA, UPMC	No	-	Yes	Yes	Stockholm, 5.2008



## Workshops &amp; Summerschools

Code	Title	Location	Dates	Report due	Bulletin	Organisers	Email addresses	Co-organisers	Funding Requested	Funding Decision	Logo Requested	Logo Decision	Reviewed
W2009-02	Immersed boundary methods	Amsterdam, Netherlands.	01/06/2009	01/12/2009	Rec.	Pourquie, J. Breugem, W-P. Boersma, B.J. Turek, S.	m.j.b.m.pourquie@tudelft.nl	PCs: JM Burgers Centre Co: EUROMECH, Royal Dutch Academy of Sci.	Yes	No	Yes	Yes	Brussels, 11.2008
W2009-03	Quality & Reliability of LES II	Pisa, Italy.	09/09/2009 - 11/09/2009	11/03/2010	81	Salvetti, M.	mv.salvetti@ing.unipi.it	SIGs: 1 Co: University of Pisa, COST Action P20 LES-AID	Yes	Yes*, 2000	Yes	Yes	Brussels, 11.2008
W2009-04	Fluxes and structures in fluids	Moscow, Russia.	24/06/2009 - 27/06/2009	27/12/2009		Chashechkin, Y.D. Baydulov, V.G.	chakin@ipmnet.ru bayd@ipmnet.ru	Sigs: 14, 42 Co: RAS	Yes	Yes*, 2000	Yes	Yes	Brussels, 11.2008
W2009-05	Papermaking research symposium *Withdrawn*	-	-	-	81	-	-	-	-	-	-	-	-
W2009-07	LES of Turbulence, Acoustics and Combustion	Marseilles, France.	24/08/2009 - 28/08/2009	28/02/2010		Comte, P. Serre, E.	pierre.comte@lea.univ-poitiers.fr eric.serre@L3m.univ-mrs.fr	PCs: France-West SIGs: 1	No	-	Yes	Yes	Brussels, 11.2008
W2009-08	Quality & Reliability in Aerospace CFD	Nottingham, UK.	04/03/2009	04/09/2009	-	Parry, J.	john_parry@mentor.com	PCs: UK SIGs: 5, 101 Co: NAFEMS	No	-	Yes	No	Brussels, 11.2008
W2009-09	Turbulent Spray Combustion	Corsica, France.	07/06/2009	07/12/2009	81	Merci, B. Roekaerts, D.	bart.merci@ugent.be d.j.e.m.roekaerts@tudelft.nl	SIGs: 28	Yes	Yes, 2000	Yes	Yes	Brussels, 11.2008
W2009-10	3rd Hybrid RANS-LES Symposium	Gdansk, Poland.	10/06/2009 - 12/06/2009	12/12/2009	Rec.	Doerffer, P. Haase, W. Peng, S-H.	doerffer@karol.imp.gda.pl office@haa.se peng@foi.se	Co: EADS, FOI, IMP-PAN	No	-	Yes	Yes	Brussels, 11.2008
W2009-11	Research in turbulence and transition	Lisbon, Portugal.	16/10/2009	16/04/2010	Rec.	Theofilis, V. Castilla, R. da Silva, C.	vassilios.theofilis@upm.es castilla@mf.upc.edu carlos.silva@ist.utl.pt	PCs: Iberian West, Iberian East SIGs: 1, 4, 14, 15, 33 Co: IST, IDMEC	Yes	Yes, 2000	Yes	Yes	Lausanne, 10, 2009
W2009-12	Turbulent flows	Ecully, France.	04/12/2009 - 05/12/2009	05/06/2010	Rec.	Naso, A. Nicolleau, F. Godeferd, F. Cambon, C.	aurore.naso@ens-lyon.fr f.nicolleau@sheffield.ac.uk Claude.Cambon@ec-lyon.fr	PCs: France Henri Bénard SIGs: 35 Co: CNRS, CBP	Yes	Yes, 2000	Yes	Yes	Lausanne, 10, 2009
W2009-13	Synthetic turbulence and vortex flows	Warsaw, Poland.	01/07/2009 - 03/07/2009	03/01/2010	81	Nowakowski, A.	a.f.nowakowski@sheffield.ac.uk	PCs: Polish SIGs: 42, 35	Yes	Yes, 2000	Yes	Yes	Budapest, 5.2009
W2009-14	14th Workshop on turbulence modelling	Rome, Italy.	18/09/2009	18/03/2010		Jakirlic, S. Rispoli, F. Borello, D.	s.jakirlic@sla.tu-darmstadt.de rispoli@dma.ing.uniroma1.it borello@dma.ing.uniroma1.it	PCs: Italy SIGs: 15 Co: IAHR, COST	Yes	Yes, 2000	Yes	Yes	Budapest, 5.2009
W2009-15	Global flow instability and control	Crete, Greece.	28/09/2009 - 30/09/2009	30/03/2010	Rec.	Theofilis, V.	vassilios.theofilis@upm.es	PCs: Iberian West SIGs: 33 Co: US AFOSR/EOARD, Caltech, Ecole Polytechnique Paris	Yes	Yes, 2000	Yes	Yes	Budapest, 5.2009
W2010-01	Workshop on fibre suspension flows	Stockholm, Sweden.	09/02/2010 - 10/02/2010	10/08/2010	Rec.	Lundell, F.	fredrik@mech.kth.se	SIGs: 43	No	-	Yes	Yes	Lausanne, 10, 2009
W2010-02	MUSAF colloquium	Toulouse, France.	27/09/2010 - 29/09/2010	29/03/2011	A	Gicquel, L. Gourdain, N. Boussuge, J-F. Poinsot, T.	lgicquel@cerfacs.fr gourdain@cerfacs.fr boussuge@cerfacs.fr poinsot@cerfacs.fr	SIGs: 1, 5, 14, 15, 28, 36, 37, 41, 101 Co: Airbus, Safran, Onera, EU(FP7)	No	-	Yes	Yes	Lausanne, 10, 2009
W2010-03	European drag reduction and flow control meeting	Kiev, Ukraine.	06/09/2010 - 09/09/2010	09/03/2011	A	Voropayev, G. Choi, K-S.	vortex@nbi.com.ua Kwing-so.Choi@nottingham.ac.uk	SIGs: 20 Co: Ukrainian Academy of Sciences	Yes	Yes, 2000	Yes	Yes	Lausanne, 10, 2009
W2010-04	Advances and applications of GiD	Ibiza, Spain.	25/05/2010 - 27/05/2010	27/11/2010		Coll, A. Castilla, R.	abelcs@cimne.upc.edu castilla@mf.upc.edu	PCs: Iberian East Co: COMPASSIS, Technical University of Catalonia	Yes	No	Yes	No	Lausanne, 10, 2009
W2010-05	Two-phase flow predictions	Halle, Germany.	22/03/2010 - 26/03/2010	26/09/2010	A	Sommerfeld, M.	martin.sommerfeld@iw.uni-halle.de	PCs: Germany North SIGs: 12	Yes	Yes, 2000	Yes	Yes	Lausanne, 10, 2009
W2010-06	Dynamics of non-spherical particles in fluid turbulence	Trondheim, Norway.	29/09/2010 - 01/10/2010	01/04/2011		Andersson, H. Soldati, A.	helge.i.andersson@ntnu.no soldati@uniud.it	PCs: Nordic SIGs: 43, 12	Yes	Yes, 2000	Yes	Yes	Lausanne, 10, 2009
W2010-07	DLES 8	Eindhoven, Netherlands.	07/07/2010 - 09/07/2010	09/01/2011		Kuerten, J.	j.g.m.kuerten@tue.nl	SIGs: 1	Yes	Yes, 2000	Yes	Yes	Budapest, 5.2009
W2010-08	Mixing and dispersion in flows dominated by rotation and b	Limburg, Netherlands.	20/06/2010 - 23/06/2010	23/12/2010		Clercx, H.	h.j.h.clercx@tue.nl	PCs: JM Burgers SIGs: 12, 14 Co: TU Eindhoven, FOM, NOW	Yes		Yes		Delft, 5.2010
W2010-09	Global instabilities of open flows	Nice, France.	30/06/2010 - 02/07/2010	02/01/2011		Chomaz, J-M. Gallaire, F. Hanifi, A.	jean-marc.chomaz@ladhyx.polytechnique.fr francois.gallaire@unice.fr ardeshir.hanifi@foi.se	SIGs: 33	Yes		Yes		Delft, 5.2010

## Workshops &amp; Summerschools

Code	Title	Location	Dates	Report due	Bulletin	Organisers	Email addresses	Co-organisers	Funding Requested	Funding Decision	Logo Requested	Logo Decision	Reviewed
W2010-10	Radiation of high temperature gases in atmospheric entry	Lausanne, Switzerland.	12/10/2010 - 15/10/2010	15/04/2011		Leyland, P. Sobbia, R.	penelope.leyland@epfl.ch raffaello.sobbia@epfl.ch	PCs: LEC Switzerland Co: ESA, CNES	Yes		Yes		Delft, 5.2010
W2010-11	6th Workshop on synthetic turbulence models	Lyon, France.	05/07/2010 - 07/07/2010	07/01/2011		Nicolleau, F. Godeferd, F.	F.Nicolleau@Sheffield.ac.uk Fabien.Godeferd@ec-lyon.fr	PCs: France Henri Bénard, UK SIGs: 14, 42	Yes		Yes		Delft, 5.2010
W2010-12	5th Workshop on research in turbulence and transition	Tarragona, Spain.	29/10/2010	29/04/2011		Vernet, A. Castilla, R.	anton.vernet@urv.cat castilla@mf.upc.edu	PCs: Iberian East, Iberian West Co: CIMNE	Yes		Yes		Delft, 5.2010
W2011-01	Cardiovascular fluid mechanics	Cagliari, Italy.	01/06/2011	01/12/2011		Querzoli, G. Pedrizzetti, G.	querzoli@unica.it giannip@dica.units.it	SIGs: 37 Co: EUORMECH	Yes		Yes		Delft, 5.2010
W2011-02	3rd Workshop on fibre suspension flows	Nancy, France.	06/04/2011 - 07/04/2011	07/10/2011		Skali-Lami, S. Hamalainen, J.	Salaheddine.Skali-Lami@ensem.inpl-nancy.fr jari.hamalainen@uef.fi	SIGs: 43 Co: CTP-Grenoble	No		Yes		Delft, 5.2010
W2011-03	2nd Workshop on turbulent spray combustion	Italy?	01/07/2011	01/01/2012		Merci, B. Roekaerts, D. Sadiki, A. Tomboulides, A.	bart.merci@ugent.be d.j.e.m.roekaerts@tudelft.nl sadiki@ekt.tu-darmstadt.de ananiast@googlemail.com	SIGs: 28 Co: Belgian section of Combustion Institute	Yes		Yes		Delft, 5.2010
W2011-04	Diagnostics for turbulent combustion	Rouen, France.	25/05/2011 - 26/05/2011	26/11/2011		Domingo, P. Moureau, V. Tomboulides, A.	domingo@coria.fr moureau@coria.fr ananiast@googlemail.com	SIGs: 28 Co: University and INSA Rouen	Yes		Yes		Delft, 5.2010

## ERCOFTAC Workshops and Summer Schools

### 1. Applications for ERCOFTAC event sponsorship

To be considered at the SPC meeting in Delft, 18<sup>th</sup> May 2010.

#### Workshops

#### Scholarships

W2010-08	Mixing and Dispersion in Flows Dominated by Rotation and Buoyancy	X
W2010-09	Global instabilities of open flows	X
W2010-10	Radiation of high temperature gases in atmospheric re-entry	X
W2010-11	6 <sup>th</sup> Workshop on synthetic turbulence models	X
W2010-12	5 <sup>th</sup> Workshop on research in turbulence and transition	X
W2011-01	Cardiovascular fluid dynamics	X
W2011-02	3 <sup>rd</sup> Workshop on Fibre suspension flows	
W2011-03	Workshop on measurement and computation turbulent spray combustion	X
W2011-04	Highly resolved diagnostics for turbulent combustion	X

#### Summer Schools

#### Scholarships

S2010-05	Fundamentals of microscale heat transfer	X
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### 2. Funding status after SPC meeting of Lausanne 2<sup>nd</sup> October 2009

2008	8WS + 6SS = 34k Euros
2009	8WS + 2SS = 22k Euros
2010	4WS + 3SS = 17k Euros

Annual funding limit: 25k Euros

### 2. Overdue reports – plus 6 months from 18<sup>th</sup> May 2010

W2007-10	Workshop on near wall turbulence	22.3.2007
W2009-04	Fluxes and structures in fluids	24.6.2009
W2009-07	LES of turbulence, acoustics and combustion	24.8.2009
W2009-14	14 <sup>th</sup> Workshop on turbulence modelling	18.9.2009

# European Research Community On Flow, Turbulence And Combustion

## WORKSHOPS/CONFERENCES/SUMMERSCHOOLS/COURSES SUMMARY SHEET

<b>Title</b>	Mixing and Dispersion in Flows Dominated by Rotation and Buoyancy  <i>Add a brief summary of the objectives of the activity (or the announcement) on a separate page</i> <b>EuroMech Colloquium #519</b>
<b>Location and Date</b>	Conference Centre Rolduc, Limburg, The Netherlands 20-23 June 2010
<b>Organizer</b>	<b>Name</b> Herman Clercx <b>Address</b> Fluid Dynamics Laboratory, CC2.19 Eindhoven University of Technology PO Box 513 NL-5600MB Eindhoven <b>Country</b> The Netherlands <b>Tel</b> +.31.40.247.2680/3110 <b>Fax</b> +.31.40.246.4151 <b>E-mail</b> h.j.h.clercx@tue.nl
<b>Pilot Center(s) or SIGs involved</b>	Dispersed turbulent two-phase flow (SIG 12) Stably stratified and rotating turbulence (SIG 14)
<b>Co-organizing Associations</b>	Additional funding is requested to reduce fees and cover expenses of invited keynote lecturers: JM Burgers Center (NL); Eindhoven University of Technology, FOM (NL), NWO (NL).
<b>Scholarships</b>	<b>request scholarships</b> Yes
<b>Rules</b>	<b>I have read the document "Rules for holding ERCOFTAC event", which can be found on <a href="http://www.ercoftac.org">www.ercoftac.org</a>, ERCOFTAC events: Yes</b>

Please return this form + annexes to

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To be filled-in by ERCOFTAC

<b>Number</b>	W2010-08
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<b>Date Received</b>	30.09.2009
<b>Discussed SPC &amp; MB</b>	<b>SPC</b> <span style="float: right;"><b>MB</b></span>
<b>Scholarships</b>	<input type="checkbox"/> Yes, Amount <span style="margin-left: 100px;">EURO</span> <input type="checkbox"/> No
<b>Announcement</b>	Bulletin
<b>Report</b>	Bulletin

## **EuroMech Colloquium # 519**

### **Mixing and Dispersion in Flows Dominated by Rotation and Buoyancy**

Rotation and buoyancy play an essential role in many geophysical, environmental and industrial flows. It strongly affects the flow properties such as inducing anisotropy of the flow and dramatically changing the turbulence properties. This inevitably has a strong impact on the dispersion of passive and active tracers and (inertial) particles in such flows. The aim of the Colloquium is to bring together researchers with interests in theoretical descriptions and numerical studies of the mixing and dispersion properties of rotation and buoyancy dominated flows, and experimentalists on rotating, stably stratified and buoyancy-driven flows, respectively. Satellite and field observations play an essential role in mixing and dispersion studies of large-scale geophysical and of environmental flows. It is intended to encourage colleagues from this field to contribute to the Colloquium. Topics of interest range from the fundamentals of mixing and dispersion in canonical systems such as vortices in rotating or stratified fluids, but also homogeneous rotating or stratified turbulence, to mixing from an Eulerian/Lagrangian point of view in geophysical, environmental and industrial flows. Special attention will also be given to interdisciplinary topics where fluid mechanics and mixing are central themes. Some examples include the (large-scale) dispersion of marine species in oceans, estuaries and lakes, mixing in drinking-water supplies, transport in rivers and estuaries, and ventilation, comfort and safety aspects in buildings and public transportation systems.

Invited keynote speakers (all confirmed):

- Dr. Annalisa Bracco, "Dispersion in geophysical flows" (Georgia Tech, USA)
- Prof. Bert Brouwers, "Particles, droplets and bubbles in rotating industrial flows" (TU/e, NL)
- Prof. Guenter Ahlers, "Thermally driven turbulence" (UCSB, USA)
- Dr. Erik Lindborg, "Dispersion and mixing in stratified turbulence" (KTH, Sweden)
- Dr. Frederic Moissy, "Experiments on rotating turbulence" (Univ. Paris Sud, Fr)
- Prof. Geoff Spedding, "Experiments in stratified fluids" (USC, USA)

Organisers:

***Prof. Herman Clercx***

Fluid Dynamics Laboratory, CC 2.19, Department of Applied Physics, Eindhoven University of Technology, PO Box 513

NL-5600 MB Eindhoven, The Netherlands

Phone: + 31 40 247 2680 or + 31 40 247 3110; Fax: + 31 40 246 4151; Email: [h.j.h.clercx@tue.nl](mailto:h.j.h.clercx@tue.nl)

Co-chairpersons:

***Dr. Beat Lüthi***

Institut f.Umweltingenieurwissenschaften, ETH Zürich, Switzerland

Email: [beat.luethi@ifu.baug.ethz.ch](mailto:beat.luethi@ifu.baug.ethz.ch)

***Prof. GertJan van Heijst***

Department of Applied Physics, Eindhoven University of Technology, The Netherlands

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Department of Applied Mathematics, Twente University, The Netherlands

Email: [b.j.geurts@math.utwente.nl](mailto:b.j.geurts@math.utwente.nl)

# European Research Community On Flow, Turbulence And Combustion

## WORKSHOPS/CONFERENCES/SUMMERSCHOOLS/COURSES SUMMARY SHEET

Title	<b>8<sup>th</sup> ERCOFTAC SIG33 workshop Global Instabilities of Open Flows</b>		
	<i>Add a brief summary of the objectives of the activity (or the announcement) on a separate page</i>		
	<input checked="" type="checkbox"/> Workshop	<input type="checkbox"/> Summerschool	<input type="checkbox"/> Conference
			<input type="checkbox"/> Course
Location and Date	<b>Nice, France June 30 – July 2, 2010</b>		
Organizer	<b>Name: Jean-Marc Chomaz (Chair.), Francois Gallaire, Ardeshir Hanifi</b>		
	<b>Address : Jean-Marc Chomaz Laboratoire d'Hydrodynamique (LadHyX) CNRS-Ecole Polytechnique 91128 Palaiseau Cedex      WWW : <a href="http://www.ladhyx.polytechnique.fr">http://www.ladhyx.polytechnique.fr</a></b>		
	<b>Country: France</b>		
	<b>Tel.: +33 (0)1 69335264</b>		<b>Fax: +33 (0)1 69335292</b>
	<b>E-mail: <a href="mailto:Jean-Marc.Chomaz@ladhyx.polytechnique.fr">Jean-Marc.Chomaz@ladhyx.polytechnique.fr</a></b>		
Pilot Center(s) or SIGs involved	<b>SIG 33</b>		
Co-organizing Associations			
Scholarships	<b>request scholarships ?</b>	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Rules	<b>I have read the document "Rules for holding ERCOFTAC event", which can be found on <a href="http://www.ercoftac.org">www.ercoftac.org</a>, ERCOFTAC events: <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No</b>		

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CH - 1015 LAUSANNE  
Switzerland

Fax: +41.21.693.53.07

**To be filled-in by ERCOFTAC**

<b>Number</b>	W2010-09
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<b>Date Received</b>	29.09.2009		
<b>Discussed SPC &amp; MB</b>	<b>SPC</b>		<b>MB</b>
<b>Scholarships</b>	<input type="checkbox"/> Yes, Amount	<b>EURO</b>	<input type="checkbox"/> No
<b>Announcement</b>	Bulletin		
<b>Report</b>	Bulletin		



## 8th ERCOTAC SIG 33 Workshop

### Global Instabilities of Open Flows

Nice, France, June 30- July 2, 2010.

- By-pass transition, experiments and scaling laws, etc.
- Nonlinear effects, "exact coherent structures", edge states, etc.
- Control, estimation and compensation, etc.
- Optimal and suboptimal control, experimental approaches, etc.
- Reduced order models, etc.

#### **Scholarships:**

A limited number of scholarships may be made available by ERCOTAC (to be confirmed).

#### **Location:**

La Maison du Séminaire Nice, France.  
<http://www.maison-seminaire-nice.cote.azur.fr>

#### **Invited speakers:**

- M. Juniper (Cambridge, UK): *Bypass transition in thermoacoustics.*
- D. Henningson (KTH, Sweden): *Linear and nonlinear model reduction for flow control.*
- C. Cossu (IMFT, France): *Optimal perturbations and coherent structures in turbulent shear flows.*
- S. Sherwin and P. Hall (Imperial college, UK): *Nonlinear unstable solutions and the transition to turbulence.*

#### **Topics:**

We invite submission of abstracts on ongoing activities on:

- Linear stability approaches, modal and non-modal theories, etc.
- Effect of stochastic and deterministic excitations, receptivity, etc.

#### **Abstract deadline:**

March 31, 2010. Abstracts are to be submitted from the following Web site: <http://www2.mech.kth.se/sig33/>

#### **Organizers:**

Francois Gallaire (LFMI, EPFL, Switzerland)  
 Jean-Marc Chomaz (LadHyX, France)  
 Ardeshir Hanifi (FOI / KTH, Sweden)

#### **Contact:**

Jean-Marc Chomaz  
 Laboratoire d'Hydrodynamique (LadHyX)  
 CNRS-Ecole Polytechnique  
 91128 Palaiseau Cedex  
 Tel.: +33 (0)1 69335264  
 E-mail: [ercoftac@ladhyx.polytechnique.fr](mailto:ercoftac@ladhyx.polytechnique.fr)

# European Research Community On Flow, Turbulence And Combustion

## WORKSHOP – CONFERENCE – SUMMER SCHOOL - COURSE APPLICATION SHEET

<b>Title</b>	4th International Workshop on Radiation of High Temperature Gases in Atmospheric Entry		
	<i>Add a brief summary of the objectives of the activity (or the announcement) on a separate page</i>		
	[ x ] Workshop    [ ] Summer School    [ ] Conference    [ ] Course		
<b>Location and Date</b>	EPFL, Lausanne, Switzerland 12 October 2010 –15 October 2010		
<b>Organizer</b>	<b>Name</b> Dr. Pénélope Leyland and Dr. Raffaello Sobbia		
	<b>Address</b> Dr. Pénélope Leyland & Dr. Raffaello Sobbia EPFL STI IGM IAG ME A2 407 (Bâtiment ME) Station 9 CH-1015 Lausanne		
	<b>Country</b> Switzerland		
	<b>Tel</b> +41(0)2169 33857 / 33884		<b>Fax</b> +41(0)216933502
	<b>Email</b> penelope.leyland@epfl.ch raffaello.sobbia@epfl.ch		
	<b>Pilot Center(s) or SIGs involved</b> ERCOFTAC Coordination Centre, EPFL, Switzerland		
<b>Co-organizing Associations</b>	ESA, CNES		
<b>Scholarships</b>	<b>Scholarship request?</b> [ X ] Yes    [ ] No		
<b>Rules</b>	<b>I have read the document "Rules for holding ERCOFTAC events", which can be found on <a href="http://www.ercoftac.org">www.ercoftac.org</a></b> [ X ] Yes    [ ] No		

To be completed by ERCOFTAC

<b>Number</b>	W2010-10
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<b>Date Received</b>	3.3.2010		
<b>Approval</b>	SPC		<b>MB</b>
<b>Scholarships</b>	[ ] Yes, Amount	EURO	[ ] No
<b>Announcement</b>	Bulletin		
<b>Report</b>	Bulletin		



## 4th International Workshop on Radiation of High Temperature Gases in Atmospheric Entry

Space Exploration is a growing field of interest with missions to Mars, Titan (Saturn moon), Jupiter and Venus either performed or programmed in a near future. Earth re-entry phenomena are also of high importance and studies on the atmospheric composition and its effect on radiation is of extreme interest for thermal studies. For all these missions the entries of the planetary probes equipped with scientific instruments in the planetary atmospheres generate highly radiative fields. During atmospheric entry, a probe goes through various atmospheric layers at high speed. It then creates upstream of the probe, a detached shock wave through which the flow is slowed and an important part of kinetic energy is transferred to the surrounding gas in the form of internal energy, which induces an abrupt increase of the temperature. This exchange of energy causes the onset of physical-chemical processes such that the radiation of species. So in addition to convection, the probe is also the target of a stream of radiation which magnitude depends on the nature of the environment and the entry speed. The design and implementation of the thermal protection system (TPS) of a spacecraft require a rigorous study of all of physical-chemical processes and it becomes of paramount importance for human space flight.

This workshop is devoted to promote a dialogue between Research Groups and Agencies across Europe on the state of the art for simulation, modelling and experimental techniques of radiating and turbulent gas flows. In this frame, exchanges take place under the form of plenary lectures, invited talks and thematic sessions where specific test cases are validated. Leading scientists in the field will be invited for the plenary lectures. In particular, efficiency and accuracy of different methods and experimental approaches are compared for the determination of radiative heat fluxes encountered during atmospheric entry. It is foreseeable that new areas for future research and collaborations between the participants will be an outcome of this workshop. Joint venture topics will be clearly defined and specific working groups formed. In addition, it is the intention of the Organising Committee to invite guest lecturers presenting works of general interest on Radiation of High Temperature Gases, including also turbulent modelling and related domains such as combustion and plasmas.

### Topics

- Scientific and technical papers on:
  - Non Equilibrium Chemical Kinetics
  - Hypersonic Flow
  - Plasma Emission and Absorption
  - Computation Fluid Dynamics
  - Instruments, experimental techniques and Facilities
  - Flight Experiments
  - Radiation Transfer
- Invited Papers of general interest on RHTG
- Test-cases, which are organized in three themes:
  - Radiation emission & transfer database and models
  - Re-building of selected radiative emission and absorption experiments
  - Numerical axially-symmetric test-case for non-equilibrium flow and radiation emission and absorption calculations
- Preparation of future test-cases:
  - Identification of suitable experimental results, relevant literature data and previous re-building activities

### Programme Structure:

The workshop will be held at the Polydome of the "Ecole Polytechnique Fédérale de Lausanne", Switzerland between Tuesday the 12<sup>th</sup> and Friday the 15<sup>th</sup> of October 2010. Local organisers are Dr. Pénélope Leyland and Dr. Raffaello Sobbia. The workshop will be open with a welcome speech from the local organisers and the ESA representative and followed by an introduction about EPFL from Prof. Giorgio Margaritondo. Talks will alternate test case presentations with round tables for discussion. The last day general syntheses will be drawn.

# European Research Community On Flow, Turbulence And Combustion

## WORKSHOPS/CONFERENCES/SUMMER SCHOOLS/COURSES SUMMARY SHEET

<b>Title</b>	ERCOFTAC/SIG 42 6th Workshop on Synthetic Turbulence Models, <i>Synthetic models and environment</i> <i>Add a brief summary of the objectives of the activity (or the announcement) on a separate page</i>														
	p Workshop <del>p Summerschool</del> <del>p Conference</del> <del>p Course</del>														
<b>Location and Date</b>	LMFA, Ecole Centrale de Lyon , Ecully, Lyon, France 5th-7th July 2010														
<b>Organizer</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2"><b>Name</b></td> </tr> <tr> <td colspan="2">Fabien Godeferd (<i>École Centrale de Lyon</i>)</td> </tr> <tr> <td colspan="2">Franck Nicolleau (<i>Sheffield Fluid Mechanics Group</i>)</td> </tr> <tr> <td colspan="2"><b>Country</b> France</td> </tr> <tr> <td><b>Tel</b> +33 (0) 4 72 18 61 55</td> <td><b>Fax</b> +33 (0) 4 72 72 80 80</td> </tr> <tr> <td colspan="2"><b>Email</b> Fabien.Godeferd@ec-lyon.fr</td> </tr> <tr> <td colspan="2"> </td> </tr> </table>	<b>Name</b>		Fabien Godeferd ( <i>École Centrale de Lyon</i> )		Franck Nicolleau ( <i>Sheffield Fluid Mechanics Group</i> )		<b>Country</b> France		<b>Tel</b> +33 (0) 4 72 18 61 55	<b>Fax</b> +33 (0) 4 72 72 80 80	<b>Email</b> Fabien.Godeferd@ec-lyon.fr			
<b>Name</b>															
Fabien Godeferd ( <i>École Centrale de Lyon</i> )															
Franck Nicolleau ( <i>Sheffield Fluid Mechanics Group</i> )															
<b>Country</b> France															
<b>Tel</b> +33 (0) 4 72 18 61 55	<b>Fax</b> +33 (0) 4 72 72 80 80														
<b>Email</b> Fabien.Godeferd@ec-lyon.fr															
<b>Pilot Center(s) or SIGs involved</b>	France Henri Bénard, United Kingdom, SIG 42. SIG14														
<b>Co-organizing Associations</b>	Sheffield Fluid Mechanics Group at the University of Sheffield														
<b>Scholarships</b>	request scholarships ?      p Yes      p <del>No</del>														
<b>Rules</b>	I have read the document "Rules for holding ERCOFTAC event", which can be found on <a href="http://www.ercoftac.org">www.ercoftac.org</a> , ERCOFTAC events: p Yes      p <del>No</del>														

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<b>Number</b>	W2010-11
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<b>Date Received</b>	23.4.2010
<b>Discussed SPC &amp; MB</b>	SPC <span style="float: right;">MB</span>
<b>Scholarships</b>	p Yes, Amount      EURO      p No
<b>Announcement</b>	Bulletin
<b>Report</b>	Bulletin

**6<sup>th</sup> Workshop on Synthetic Turbulence Models**  
5<sup>th</sup>-7<sup>th</sup> July 2010, Ecole Centrale de Lyon, Ecully, France

## **Synthetic models and environment**

**LMFA, Ecole Centrale de Lyon - Henri Bénard pilot Centre, Ecully, Lyon, France**

**Co-organizer (local): Dr F. Godefert**

Ecole Centrale de Lyon, LMFA,  
36 avenue Guy de Collongue - BP 163,  
69131, Ecully CEDEX, France

**Co-organizer: Dr F. Nicolleau**

University of Sheffield, Sheffield Fluid Mechanics, Department of Mechanical Engineering  
Mappin Street  
Sheffield S1 3JD, United Kingdom

### **Aims of the workshop**

This workshop is the 6th workshop held by the ERCFOFTAC Special Interest Group on Synthetic Turbulence Models (SIG42). It follows those held

29th-30th May, 2007	The University of Sheffield, UK
29th-30th November, 2007	UPC, Vilanova i la Geltru, Spain
3th-4th July 2008	The University of Newcastle, UK
11th-12th December 2008	Nancy-Université, France
1st-3rd July 2009	Warsaw University of Technology, Poland

It is open to anyone interested in environmental flow modelling and/or "synthetic turbulence" including (but not restricted to) Kinematic Simulation, (KS hereinafter). More fundamental talks on particle dispersion in turbulent flows are also welcome. The workshop will also welcome people from the COST action on "Particles in Turbulence" following last meeting in Rome 18-19 December 2009.

KS is widely used in various domains, including Lagrangian aspects in turbulence mixing/stirring, particle dispersion/clustering, and last but not least, aeroacoustics. Flow realisations with complete spatial, and sometime spatio-temporal, dependency, are generated via superposition of random modes (mostly spatial, and sometime spatial and temporal, Fourier modes), with prescribed constraints such as: strict incompressibility (divergence-free velocity field at each point), high Reynolds energy spectrum. The present workshop will investigate the use of KS and other synthetic turbulence models for the particular application to environmental flows. Either atmospheric dispersion (Ecole Centrale de Lyon) or maritime pollution (UPC, links with SIG14) will be discussed. The role of KS as potential turbulence subgrid for such applications will also be debated.

# European Research Community On Flow, Turbulence And Combustion

## WORKSHOP – CONFERENCE – SUMMER SCHOOL - COURSE APPLICATION SHEET

<b>Title</b>	Fifth Workshop on Research in Turbulence and Transition <i>Add a brief summary of the objectives of the activity (or the announcement) on a separate page</i> <input checked="checked" type="checkbox"/> Workshop <input type="checkbox"/> Summer School <input type="checkbox"/> Conference <input type="checkbox"/> Course
<b>Location and Date</b>	2010 October 29 <sup>th</sup> ETS Enginyeria Químic, Universitat Rovira I Virgili, Tarragona, Spain
<b>Organizer</b>	<b>Name</b> Antonio Vernet Peña <sup>(a)</sup> ; Roberto Castilla López <sup>(b)</sup>
	<b>Address</b> <sup>(a)</sup> Universitat Rovira I Virgili, ETS Enginyeria Químic, Dept. Mechanical Engineering, Avd. Països Catalans 26, 43007 Tarragona <sup>(b)</sup> Universitat Politècnica de Catalunya Dept. Fluid Mechanics C/Colom, 11, 08222 Terrassa, Barcelona
	<b>Country</b> Spain
	<b>Tel</b> (+34) 977 559 685 <b>Fax</b> (+34) 977 559 691
	<b>Email</b> <a href="mailto:anton.vernet@urv.cat">anton.vernet@urv.cat</a> ; <a href="mailto:castilla@mf.upc.edu">castilla@mf.upc.edu</a>
<b>Pilot Center(s) or SIGs involved</b>	Iberian East Pilot Center ; Iberian West Pilot Center
<b>Co-organizing Associations</b>	International Centre for Numerical Methods in Engineering (CIMNE) ETS Enginyeria Químic (University Rovira i Virgili)
<b>Scholarships</b>	<b>Scholarship request?</b> <input checked="checked" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Rules</b>	<b>I have read the document "Rules for holding ERCOFTAC events", which can be found on <a href="http://www.ercoftac.org">www.ercoftac.org</a></b> <input checked="checked" type="checkbox"/> Yes <input type="checkbox"/> No

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<b>Date Received</b>			
<b>Approval</b>	<b>SPC</b>	<b>MB</b>	
<b>Scholarships</b>	<input type="checkbox"/> Yes, Amount      EURO	<input type="checkbox"/> No	
<b>Announcement</b>	Bulletin		
<b>Report</b>	Bulletin		

## **Fifth Workshop on Research in Turbulence and Transition**

This is the fifth edition of the annual series of workshops dedicated to discuss the recent research developments and to disseminate the latest scientific activity in the field of turbulence and transition including theoretical, numerical and experimental aspects of the fluid mechanics and transport phenomena.

The workshop is part of a series of symposia established in 2003. Past editions have been jointly supported by ERCOFTAC and have established a forum for presentation and discussion of results and open issues in turbulence physics, transition and modeling. In particular, focus is placed on advances in theory, modeling, numerical algorithms, and experimental techniques devoted to fundamental and applied research in turbulent and transitional flows. The intended target audience encompasses specialists who have contributed to pioneering developments in this field and are willing to promote the synergy between theory, experiment and computation in order to advance both the frontiers of knowledge and technology transitions in this field.

These Workshops have been conducted at the initiative of CIMNE, Iberian-East and Iberian-West Pilot Centres of the ERCOFTAC. The first edition of this Workshop was held on February, 2003 at the International Centre for Numerical Methods in Engineering at the Technical University of Catalonia, the second was held at the School of Aeronautical Engineering at the Technical University Madrid on February of 2004, and the third one took place in the College of Engineering at the University of Seville on October, 2008. The last edition was organized in the Instituto Superior Tecnico of the Technical University of Lisbon, in Portugal, the October of 2009. In that event, 16 scientific high-level communication were presented from research groups of Barcelona, Seville, Zaragoza, Tarragona, Girona, Lisbon, Oporto, Coimbra, and Beira Interior

The fifth edition will be held in the E.T.S. Ingeniería Química of the Universitat Rovira I Virgili in Tarragona, Spain. Material and human resources of the Department of Mechanical Engineering will work for the success of this new edition of the Workshop.

The main aim of this one-day workshop is to contribute to a better knowledge of the activities carried out by various Iberian research groups in any field relevant to the turbulence or/and Transition. The workshop will be held in English and it will also be open to any participant from the ERCOFTAC community out of the Iberian PC. All the contributions selected for presentation will be published online, while a summary will appear in the ERCOFTAC bulletin.

# European Research Community On Flow, Turbulence And Combustion

## WORKSHOP – CONFERENCE – SUMMER SCHOOL - COURSE APPLICATION SHEET

<b>Title</b>	<b>Cardiovascular Fluid Mechanics: from theoretical aspects to diagnostic and therapeutic support.</b>  Joint with an EUROMECH Colloquium (see proposal on separate sheet). [ X ] Workshop   [ ] Summer School   [ ] Conference   [ ] Course
<b>Location and Date</b>	<b>June 2011, Cagliari (Italy)</b>
<b>Organizer</b>	<b>Giorgio Querzoli (Chairman), Gianni Pedrizzetti (co-Chairman)</b> D.I.T. University of Cagliari Piazza D'Armi. 09123 Cagliari (Co-Chairman: D.I.C.A. University of Trieste) Italy Tel +39 070675 5308                                  Fax +39 070675 5310 Email: <a href="mailto:querzoli@unica.it">querzoli@unica.it</a> ; (co-Chairman) <a href="mailto:giannip@dica.units.it">giannip@dica.units.it</a>
<b>Pilot Center(s) or SIGs involved</b>	<b>SIG 37 - Bio-Fluid Mechanics and Heat Transfer</b>
<b>Co-organizing Associations</b>	
<b>Scholarships</b>	<b>Scholarship request?                                  [X] Yes                  [ ] No</b>
<b>Rules</b>	<b>I have read the document "Rules for holding ERCOFTAC events", which can be found on <a href="http://www.ercoftac.org">www.ercoftac.org</a>                  [ X ] Yes                  [ ] No</b>

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**Number** || W2011-01

<b>Date Received</b>	3.3.2010
<b>Approval</b>	SPC    MB
<b>Scholarships</b>	[ ] Yes, Amount                  EURO                  [ ] No
<b>Announcement</b>	Bulletin
<b>Report</b>	Bulletin

# Proposal for a Euromech Colloquium

**Title of the Colloquium:** Cardiovascular Fluid Mechanics

**Date and location:** June 2011, Cagliari (Italy)

**Chairman:** Prof. Giorgio Querzoli, University of Cagliari (querzoli@unica.it)

**Co-Chairman:** Prof. Gianni Pedrizzetti, University of Trieste (giannip@dica.units.it)

**Intended scientific scope:**

Subtitle: from theoretical aspects to diagnostic and therapeutic support.

The fluid mechanics inside the cardiovascular system has been extensively studied in the last decades and many results on the hemodynamics in sites of physiological interest are reported in the literature. Nevertheless, the contribution of fluid dynamics to the actual progress in the medical disciplines is still at an embryonic stage.

The transfer of the physical, mathematical and engineering concepts into the clinical practice (medical reality), where the information available and the sought answers can be quite different from those commonly required in technical fields, is a current challenging task. This task requires a profound interdisciplinary approach and the careful combination of qualitative fluid dynamics understandings with quantitative techniques of analysis.

These challenges are being overcome by a small but increasing number of research teams in the world. Indeed, time appears mature for contributions from cardiovascular fluid mechanics modeling to the future clinical practice. Substantial progresses are becoming more and more realistic by combining the technical capabilities developed in engineering areas with the improving quantitative knowledge in physiology and pathophysiology. The latter has substantially benefited of the new quantitative diagnostic tools and techniques now available that can support a large amount of information to fluid dynamics scientists.

This meeting aims to join researchers working in the different aspects of cardiovascular fluid dynamics. Topics should cover theoretical aspects, computational models, and experimental techniques, including also clinical measurements and interfacing with medical imaging. The objective is to face together the challenge of progressing in this area and design together some future clinical solutions.





**WORKSHOPS/CONFERENCES/SUMMERSCHOOLS/COURSES  
SUMMARY SHEET**

<b>Title</b>	“2 <sup>nd</sup> International Workshop on Measurement and Computation of Turbulent Spray Combustion (TCS 2)” (Please see brief summary in the next page) <i>Add a brief summary of the objectives of the activity (or the announcement) on a separate page</i>
	<input checked="" type="checkbox"/> Workshop <input type="checkbox"/> Summerschool <input type="checkbox"/> Conference <input type="checkbox"/> Course
<b>Location and Date</b>	Summer of 2011; Location: to be determined (same location as Mediterranean Combustion Symposium, presumably Italy)
<b>Organizer</b>	<b>Name:</b> Prof. B. Merci (Ghent University, Belgium), Prof. D. Roekaerts (Delft University of Technology, The Netherlands) and Prof. A. Sadiki (Darmstadt University of Technology, Germany)
	<b>Address:</b> Department of Flow, Heat and Combustion Mechanics Sint-Pietersnieuwstraat 41 B-9000 Ghent
	<b>Country:</b> Belgium
	<b>Tel</b> +32 9 264 33 14 <b>Fax:</b> +32 9 264 35 75
	<b>E-mail:</b> <a href="mailto:Bart.Merci@UGent.be">Bart.Merci@UGent.be</a>
<b>Pilot Center(s) or SIGs involved</b>	SIG28 Reacting Flows
<b>Co-organizing Associations</b>	Co-organized also with the Belgian Section of the Combustion Institute
<b>Scholarships</b>	request scholarships ? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Rules</b>	<b>I have read the document "Rules for holding ERCOFTAC event", which can be found on <a href="http://www.ercoftac.org">www.ercoftac.org</a>, ERCOFTAC events:</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

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<b>Number</b>	W2011-03
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<b>Date Received</b>	30.04.2010
<b>Discussed SPC &amp; MB</b>	SPC    MB
<b>Scholarships</b>	<input type="checkbox"/> Yes, Amount      EURO <input type="checkbox"/> No
<b>Announcement</b>	Bulletin
<b>Report</b>	Bulletin

## **2<sup>nd</sup> International Workshop on Measurement and Computation of Turbulent Spray Combustion (TCS 2)**

**2011**

The ERCOFTAC special interest group 28 “Combustion” and the Belgian Section of the Combustion Institute are co-organizing a workshop on Measurement and Computation of Turbulent Spray Combustion. This workshop will report on the progress of experimental and numerical techniques in two-phase flows with emphasis on spray combustion and will take place one day before and at the same venue with the 7<sup>th</sup> Mediterranean Combustion Symposium, in the summer of 2011.

Turbulent spray combustion of liquid fuels is important in many technical applications. Design and optimization of industrial combustion devices is nowadays supported by numerical simulations. Whereas single phase turbulent gaseous reacting flow simulations are becoming more and more mature, with the help of very well documented experimental flame databases, this is not yet the case for multi-phase combustion. One aspect is the difficulty to perform accurate experiments. The other aspect is that the complexity of the interacting physical and chemical processes occurring in spray combustion requires accurate modelling and advanced numerical methods.

The objective of this meeting is to bring researchers together to discuss and exchange ideas on recent developments in the field of turbulent spray combustion and related subjects.

In the first workshop, held in Ajaccio, 2009, two invited lectures, given by experts in the field of turbulent spray combustion (Prof. Eva Gutheil, Heidelberg, and Prof. Assaad Masri, Sydney), initiated discussions and participants presented their work in contributed poster presentations. Some possible target test cases have been identified for numerical simulations, for which experimental databases will be developed and on which modelling and numerical algorithm issues will be tested..

In the second workshop, the focus will be on round-table discussions on the assessment of state-of-the-art and on future collaboration in experimental as well as computational techniques in spray combustion. The target test cases will serve as the guiding basis for the discussions. Poster presentations with recent results will remain an important aspect of the workshop as well.

A small registration fee will be paid by participants. The ERCOFTAC contribution will be used for a reduction in the registration fee for ERCOFTAC members as well as to allow free participation for a number of young researchers. Other expenses of the workshop include workshop room rental, travel expenses of the two invited lecturers, lunch and coffee breaks.

Local Organising Committee:

Prof. B. Merci (Ghent University, Belgium)

Prof. D. Roekaerts (Delft University of Technology, The Netherlands)

Prof. A. Sadiki (Darmstadt University of Technology, Germany)

**WORKSHOPS/CONFERENCES/SUMMERSCHOOLS/COURSES  
SUMMARY SHEET**

<b>Title</b>	"Highly Resolved Experimental and Numerical Diagnostics for Turbulent Combustion" HRTR-1 (Please see brief summary in the next page) <i>Add a brief summary of the objectives of the activity (or the announcement) on a separate page</i>
	<input checked="checked" type="checkbox"/> Workshop <input type="checkbox"/> Summerschool <input type="checkbox"/> Conference <input type="checkbox"/> Course
<b>Location and Date</b>	Rouen, France, May 25-26 2011
<b>Organizer</b>	<b>Name:</b> Dr. P. Domingo and Dr. V. Moureau (CNRS, Rouen University and INSA of Rouen)
	<b>Address:</b> CORIA, Campus du Madrillet, BP 8 76 800 Saint-Etienne-Du-Rouvray
	<b>Country:</b> FRANCE
	<b>Tel</b> +33 2 32 95 97 93 <b>Fax:</b> +33 2 95 97 93
	<b>E-mail:</b> <a href="mailto:domingo@coria.fr">domingo@coria.fr</a> , <a href="mailto:moureau@coria.fr">moureau@coria.fr</a>
<b>Pilot Center(s) or SIGs involved</b>	SIG28 Reacting Flows
<b>Co-organizing Associations</b>	University and INSA Rouen
<b>Scholarships</b>	<b>request scholarships ?</b> <input checked="checked" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Rules</b>	<b>I have read the document "Rules for holding ERCOFTAC event", which can be found on <a href="http://www.ercoftac.org">www.ercoftac.org</a>, ERCOFTAC events:</b> <input checked="checked" type="checkbox"/> Yes <input type="checkbox"/> No

Please return this form + annexes to  
 ERCOFTAC Coordination Centre  
 EPFL-STI-IE (LMF)  
 CH - 1015 LAUSANNE  
 Switzerland

Fax: +41.21.693.53.07

**To be filled-in by ERCOFTAC**

<b>Number</b>	W2011-04
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<b>Date Received</b>	30.04.2010
<b>Discussed SPC &amp; MB</b>	<b>SPC</b> <b>MB</b>
<b>Scholarships</b>	<input type="checkbox"/> Yes, Amount                  EURO <input type="checkbox"/> No
<b>Announcement</b>	Bulletin
<b>Report</b>	Bulletin

# **Highly Resolved Experimental and Numerical Diagnostics for Turbulent Combustion HRTR-1**

**Rouen, France, May 24-25, 2011**

The objective of this ERCOFTAC conference is to bring together experts in newly developed experimental and numerical techniques for tackling turbulent flames and featuring high resolution; typically high-speed diagnostics (planar laser simultaneous measurements PIV & PLIF) and high-resolution simulations (Direct Numerical Simulation-DNS or Large Eddy Simulation-LES with billions points and complex chemistry).

Recent progress in computer architecture (massively parallel and high performance computing) renders it possible to envisage "routine" high fidelity simulations running on thousands of processors with billions of cells. As a first consequence, highly refined LES and even DNS of geometries similar the one encountered in industrial devices become feasible. The second consequence is that the current approaches of turbulent combustion modelling need to be revisited. Most of the target experiments that have been used in the past two decennia for the validation of the modelling approaches have been designed with simple geometries and relatively small Reynolds number, to accommodate the computing resources of that period. On the other side, experimental techniques have also enormously progressed (high speed cameras, simultaneous measurements of velocities and temperature with increased spatial and temporal resolution...) opening new possibilities for comparisons between simulation and experimental studies. New challenging well-documented experimental set-ups are now emerging to support and complement high-fidelity numerical simulations.

This meeting will bring researchers from experimental and computational background together to share a very up-to-date state-of-the-art of both disciplines and pave the way for the next decade challenges in the context of turbulent combustion: advanced design assisted by simulation, prediction of pollutants, inclusion of multi-physics in the models (radiation, soot, spray...).

Four invited lectures, by experts in the field of turbulent combustion (two experimental and two computational), will be given, and participants will have the opportunity to present their work in contributed oral or poster presentations. These presentations will promote discussions between researchers using experimental techniques and researchers using LES or DNS to gain understanding in combustion.

Participants will pay a modest registration fee. The ERCOFTAC contribution will be used towards reducing the registration fee for ERCOFTAC members as well as to allow free participation for a number of young researchers. Other expenses of the conference include conference room rental, travel expenses of the four invited lecturers, lunch and coffee breaks.

Local Organising Committee:

Dr Pascale Domingo (CNRS, University and INSA de Rouen)

Dr Vincent Moureau (CNRS, University and INSA de Rouen)

# European Research Community On Flow, Turbulence And Combustion

## WORKSHOP – CONFERENCE – SUMMER SCHOOL - COURSE APPLICATION SHEET

<b>Title</b>	Fundamentals of microscale heat transfer: Boiling, condensation, single and two-phase flows <i>Add a brief summary of the objectives of the activity (or the announcement) on a separate page</i>
	[ ] Workshop      [X] Summer School      [ ] Conference      [ ] Course
<b>Location and Date</b>	EPFL, Lausanne, Switzerland. 7-11 <sup>th</sup> June 2010
<b>Organizer</b>	<b>Name</b> Prof. John R. THOME (R-CH-16)
	<b>Address</b> Laboratory of Heat and Mass Transfer EPFL-STI-IGM-LTCM ME G1 465 Station 9 CH-1015 Lausanne VD Switzerland
	<b>Tel</b> +41 (0)21 693 5981 <b>Fax</b> +41 (0)21 693 5960
	<b>Email</b> john.thome@epfl.ch
<b>Pilot Center(s) or SIGs involved</b>	
<b>Co-organizing Associations</b>	
<b>Scholarships</b>	<b>Scholarship request?</b> [X] Yes      [ ] No
<b>Rules</b>	<b>I have read the document "Rules for holding ERCOFTAC events", which can be found on <a href="http://www.ercoftac.org">www.ercoftac.org</a></b> [X] Yes [ ] No

Please return this form, and its annexes, by email or fax to:

ERCOFTAC Coordination Centre, EPFL, Switzerland.

Email: [ercoftac@epfl.ch](mailto:ercoftac@epfl.ch)

Fax: +41 21 693 5960

To be completed by ERCOFTAC

<b>Number</b>	S2010-05
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<b>Date Received</b>	15.2.2010
<b>Approval</b>	<b>SPC</b> <b>MB</b>
<b>Scholarships</b>	[ ] Yes, Amount      EURO      [ ] No
<b>Announcement</b>	Bulletin
<b>Report</b>	Bulletin

# FUNDAMENTALS OF MICROSCALE HEAT TRANSFER: BOILING, CONDENSATION, SINGLE- AND TWO-PHASE FLOWS

A Five Day Short Course at the EPFL in Lausanne, Switzerland (June 7-11, 2010)

Course Host: Heat Transfer Research Inc. (HTRI), 150 Venture Drive, College Station, Texas, USA

## COURSE DESCRIPTION

In response to the numerous evolving technologies and applications based on microscale flow and heat transfer, the present course has been developed to provide a broad, fundamental state-of-the-art review on this emerging topic. The course provides a comprehensive treatment of both single-phase flow and heat transfer *and* two-phase flow and heat transfer in microchannels. The course is directed to heat transfer specialists in the computer and electronics cooling industries, the automotive and the air-conditioning industries, the aerospace industry, and the micro- and compact heat exchanger industries. Furthermore, the course is addressed to Ph.D. students and post-doctoral researchers involved in this area of research. The course lecturers are internationally recognized experts in micro-scale (and macro-scale) research and applications. The course format is informal with significant interaction during and after the lectures.

## COURSE LECTURERS

**John R. Thome** (*Course Coordinator and Lecturer*) is Professor of Heat and Mass Transfer at the Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland, where his research interests are two-phase flow and heat transfer in microscale and macroscale processes. He received his Ph.D. at Oxford University (1978) and ran his own international engineering consulting company from 1984-1998. He is the author of three books and received the ASME Heat Transfer Division's Best Paper Award in 1998 for his work on flow boiling heat transfer and the UK IOR J&E Hall Gold Medal (2008) for his work on refrigeration heat transfer. He has published extensively on boiling and two-phase flow in microchannels and micro-evaporators. He will lecture on two-phase flow and heat transfer.

**Dr. Bruno Michel** (*Invited Lecturer*) is Mgr. of Advanced Thermal Packaging at IBM Zürich Research Laboratory. He received his Ph.D. in biochemistry/biophysics from the University of Zürich in 1988 and then joined the IBM, where he later started the Advanced Thermal Packaging group in 2003 on improved thermal interfaces and better miniaturized convective cooling. Main current research topics of the Zürich group are microtechnology/microfluidics for efficient chip and data center thermal management, hybrid liquid/air coolers, 3D packaging and thermophysics to understand heat transfer in nanomaterials and structures. He will speak on the state-of-the-art of computer cooling technologies.

**Iztok Zun** (*Lecturer*) is Professor and Head of the Laboratory for Fluid Dynamics and Thermodynamics, Faculty of Mechanical Engineering, University of Ljubljana, Slovenia. He received his Ph.D. at the University of Ljubljana (1976) and the JSMF Award in 2003. He has a very distinguished international reputation on transient characteristics and multi-scale modeling of two-phase flows for a wide range of two-phase processes *and* their industrial application. He is working on visualization and modeling of two-phase flows in headers of multi-microchannel elements, elongated bubble flows and bubble coalescence. He will lecture on the numerical simulation of single-phase microchannel cooling elements and the status of numerical techniques for two-phase flows in microchannels of simple and complex geometry.

**Gian Piero Celata** (*Lecturer*) is Director of the Institute of Thermal-Fluid Dynamics at the Italian national research center ENEA and is honorary chair of the European Two-Phase Flow Group among his many international appointments. He received his Ph.D. at the University of Rome (1980) and the JSMF Award in 2003. He is a world expert on measurement and prediction of critical heat fluxes and has in recent years done extensive research on single-phase flow and boiling heat transfer in microchannels, including work at zero gravity and on heat pipes. He is also very well known for the numerous international research conferences he has organized and chaired and he has edited numerous books. He will focus his lectures on the state-of-the-art of single-phase heat transfer and fluid flow in simple and complex geometries and on condensation and boiling heat transfer in microchannels.

**Anthony M. Jacobi** (*Lecturer*) is Kritzer Distinguished Professor of the Department of Mechanical Science and Engineering at the University of Illinois Champaign-Urbana and is Co-director of the Air-Conditioning and Refrigeration Center (ACRC) with 30 industrial sponsors. He received his Ph.D. from Purdue University (1989) and is widely known for his research on microscale heat transfer (he is co-author of the 3-zone flow boiling model with J.R. Thome). He is a leading world expert on air-side heat transfer in compact heat exchangers. His lectures will focus on air-side heat transfer of compact heat exchangers, including the best prediction methods for heat transfer and pressure drop, flow visualization results, heat transfer enhancement and evaluation methods, frost formation and condensate retention effects, and emerging methods to manage condensate during simultaneous heat and mass transfer.

**Heat Transfer Research Inc. (Host)** is a well-known industrial research and development consortium founded in 1962 with over 600 member companies from around the world and extensive experience in training ([www.htri.net](http://www.htri.net)).

## DETAILED PROGRAM

### Monday, June 7

- 12.30 – 12.45 Registration
- 12.45 – 13.00 Introduction to Course (Thome)
- 13.00 – 13.15 Overview of Microscale Heat Transfer and Its Applications (Thome)
- 13.15 – 14.00 Single-Phase Fluid Flow: Differences in Macro- and Micro-Scale (Celata)
- 14.00 – 14.45 Single-Phase Fluid Flow: Experimental Techniques and Studies in Micro-Scale (Celata)
- 14.45 – 15.00 *Coffee Break*
- 15.00 – 15.45 Macroscale Two-Phase Flows and Flow Pattern Maps (Thome)
- 15.45 – 17.30 Principles of Air-Side Heat Transfer in Compact Heat Exchangers (Jacobi)
- 17.30 – 18.30 Heat Transfer Enhancement and Performance Evaluation Criteria (Jacobi)

### Tuesday, June 8

- 08.30 – 09.15 Microscale Two-Phase Flows and Flow Pattern Maps (Thome)
- 09.15 – 10.00 Phenomenological Modeling of Bubble Dynamics in Microchannels (Thome)
- 10.00 – 10.15 *Coffee Break*
- 10.15 – 11.00 Simultaneous Heat and Mass Transfer: Frosted-Surfaces (Jacobi)
- 11.00 – 11.45 Single-Phase Heat Transfer: Differences in Macro- and Micro-Scale (Celata)
- 11.45 – 12.30 Simultaneous Heat and Mass Transfer: Wet Surfaces (Jacobi)
- 12.30 – 13.15 Emerging Surface Designs and Air-Side Innovations (Jacobi)
- 13.15 – 14.30 *Lunch Break*
- 14.30 – 17.00 *Tour of Two-Phase Flow and Heat Transfer Lab and Discussions*

### Wednesday, June 9

- 08.30 – 10.00 Void Fraction Measurements and Models for Macro- and Microchannels (Thome)
- 10.00 – 10.15 *Coffee Break*
- 10.15 – 11.15 Single-Phase Heat Transfer: Experimental Techniques and Studies in Micro-Scale (Celata)
- 11.15 – 12.00 Condensation in Microchannels: Experimental Studies and Predictive Tools (Celata)
- 12.00 – 13.15 *Lunch Break*
- 13.15 – 14.00 Microchannel Flow Boiling Experimental Studies (Celata)
- 14.00 – 14.45 State-of-the-Art of Computer Cooling Technologies (Michel)
- 14.45 – 15.15 *Coffee Break*
- 15.15 – 16.00 Microchannel Flow Boiling Heat Transfer Models-I (Thome)
- 16.00 – 17.00 Numerical Modeling of Microscale Single-Phase Flows (Zun)

### Thursday, June 10

- 08.30 – 09.15 Transient Characteristics of Phase Interface in Microchannels (Zun)
- 09.15 – 10.00 Microchannel Flow Boiling Heat Transfer Models-II (Thome)
- 10.00 – 10.15 *Coffee Break*
- 10.15 – 12.00 Numerical Modeling of Two-Phase Flows in Microchannels (Zun)
- 12.00 – 13.15 *Lunch Break*
- 13.15 – 14.00 Principles of Multiscale Modeling of Two-Phase Flows (Zun)
- 14.00 – 14.45 Two-Phase Pressure Drop Models and Data for Macroscale Channels (Thome)
- 14.45 – 15.15 *Coffee Break*
- 15.15 – 16.00 Two-Phase Pressure Drop Models for Microscale Channels (Thome)
- 16.00 – 17.00 CHF in Microchannels (Thome)

### Friday, June 11

- 08.30 – 09.15 Hierarchical Decomposition and Boundary Conditions in Two-Phase Flow (Zun)
- 09.15 – 10.00 Perspectives in Numerical Modeling of Two-Phase Flow in Microchannels (Zun)
- 10.00 – 10.15 *Coffee Break*
- 10.15 – 11.00 Numerical Simulations of Transient Conduction in Microchannel Heat Sinks (Thome)
- 11.00 – 12.00 Two-Phase Flow and Boiling of CO<sub>2</sub> in Macro- and Microchannels (Thome)
- 12.00 – 12.15 Closing Remarks/Distribution of Course Certificates (Thome)

## COURSE LOCATION AND TRAVEL INFORMATION

(The location of the EPFL lecture room will be sent by e-mail before the course)

The course will be held on the campus of the Swiss Federal Institute of Technology Lausanne (EPFL) located in Lausanne, Switzerland (see website at [www.epfl.ch](http://www.epfl.ch) for information on the university, site maps, road maps, etc.). Lausanne is easily reached within Europe by train (see website of Swiss railroad [www.cff.ch](http://www.cff.ch) for train schedules to/from Lausanne), by air (nearest airport is Geneva and this airport has direct trains to Lausanne, about 4 trains per hour of 50 minute duration, see previous website for schedules) and by car. The EPFL is easily reached by the TSOL tram line from the city center (get on at *FLON* and get off at *EPFL* stop). This tram departs about every 8 minutes and takes about 15 minutes from the city center to the EPFL stop (purchase ticket on platform from machine before boarding the tram or at the ticket office at FLON). Obtain information to get to the *FLON* station at your hotel. If you reside in a hotel in Ouchy (part of Lausanne on Lake Geneva), there is a tram from Ouchy to reach FLON (your hotel can give you information) and also a new underground tram from the north-side of Lausanne to FLON. Limited parking (*paid*) at the EPFL is available in an underground garage (follow signs from main entrance)...recommend arriving by tram or taxi. May is a beautiful time to visit Lausanne so try to spend an extra day to visit. The Lausanne city website is available at [www.lausanne-tourisme.ch](http://www.lausanne-tourisme.ch)

An e-mail with the location and room number of the lecture room on campus for the course and how to arrive there will be sent before the course to each participant. The EPFL website also allows you to input a room number and print out a map indicating its location on campus. Participants should arrive in time for the registration period on Monday.

## COURSE INSCRIPTION FEE

**Course Inscription Fee:** \$1490 U.S. dollars for each participant, except for Ph.D. students there is a discount rate of \$1190 U.S. dollars per person. Registration deadline is June 1. Cancellations will be charged a 25% cancellation fee. Fill in [Registration Form](#) to register. Remember to book your hotel room *early* this year.

## HOTEL RESERVATION INFORMATION

(Participant must contact a hotel or travel agent to make his/her own hotel room reservation)

For assistance with booking your hotel room (and travel) for the course, the Tech Travel agency located on the EPFL campus is available to handle your reservation. Phone number is +41 (21) 693 4999, fax number is +41 (21) 693 4990 and their e-mail is [Techtrav@worldcom.ch](mailto:Techtrav@worldcom.ch) (attention to Mr. Reza Nafissy). Tech Travel is holding a limited number of rooms for the course at several local hotels, so book early. Mention the *Microscale Heat Transfer* course as the contact code to Tech Travel. The exchange rate from Swiss francs to euro is about 1.5 CHF to one euro. **Please note:** Lausanne is very busy with tourists in June and also conferences. *Hence, it is wise to book your hotel as early as possible!*





ERCOTAC

From January 1st, 2009 to December 31st, 2009

Assets	2009	2008	2007	Liabilities and Capital	2009	2008	2007
<b>I. Current Assets</b>				<b>I. Current Liabilities</b>			
<b>A. Cash/ Bank Accounts</b>				<b>A. ADO Office</b>			
Checking Account ERCOTAC Euro	76,173.02 €	48,765.86 €	4,676.55 €		- €	0.00 €	
Term Account ERCOTAC Euro	148,946.39 €	248,064.46 €	300,440.23 €	<b>B. Summerschool conceded</b>			
Cash	634.78 €				- €		9,000.00 €
Checking Account Promuval Euro				<b>C. Workshop conceded</b>			
Checking ETMM7	11,893.01 €	5,925.64 €	21,219.53 €		0.00 €		W2007-02 2,000.00 €
Checking Account ERCOTAC UK	0.00 €	10,000.00 €				6,000.00 €	W2007-13 1,000.00 €
Checking Account Q&T-SIG Euro	8,463.56 €	19,292.11 €	34,047.57 €	<b>D. Business plan</b>			
Term Account Q&T-SIG	44,633.65 €	52,857.76 €	75,927.58 €		- €	- €	
	290,744.41 €	384,905.83 €	436,311.46 €	<b>E. Ercoftac Award</b>			
					- €	- €	
				<b>F. Chairman Mr. Oliemans</b>			
					452.03 €	452.03 €	2,607.02 €
				<b>Mr. Hutton -Advance Payment</b>			
					- €	- 2,907.33 €	- 2,000.00 €
				<b>G. Web site</b>			
				<b>H. Revenue reserve account</b>			
				<b>Financial charges AIBS</b>			
					449.60 €	1,217.77 €	632.50 €
				<b>Financial charges Q&amp;T</b>			
					96.31 €	332.75 €	243.13 €
				<b>Financial charges ETMM</b>			
					7.59 €		
				<b>Sales</b>			
					500.00 €	0.00 €	500.00 €
				<b>I. Upgrade Knowledge Base</b>			
						- €	
				<b>J. Second edition BPG</b>			
						- €	
				<b>K. Coordination Center</b>			
						- €	
				<b>L. FTAC journal</b>			
					0,00	2,000.00 €	
				<b>M. Ecccomas</b>			
						- €	
				<b>N. Bills received but not yet paid</b>			
					38,415.57 €	50,810.54 €	1,697.41 €
				<b>O. Taxes and National insurance</b>			
					-322.95	11,349.26 €	
				<b>Total Current Liabilities</b>			
					39,598.15 €	78,255.02 €	6,680.06 €
				<b>II. Long-Term Liabilities</b>			
				<b>Total Long-Term Liabilities</b>			
					0.00 €	0.00 €	0.00 €
				<b>Total Liabilities</b>			
					39,598.15 €	78,255.02 €	6,680.06 €
				<b>III. Capital</b>			
				<b>Net Result ERCOTAC</b>			
					297,536.50 €	272,011.72 €	340,064.36 €
				<b>Net Result IRA</b>			
					13,020.10 €	69,079.92 €	102,494.09 €
				<b>Total Capital</b>			
					310,556.60 €	341,091.64 €	442,558.45 €
				<b>Total Liabilities and Capital</b>			
					350,154.75 €	419,346.66 €	449,238.51 €
				<b>Total Assets</b>			
					350,154.75 €	419,346.66 €	449,238.51 €
				<b>II. Fixed Assets</b>			
				<b>Total Fixed Assets</b>			
					0.00 €	0.00 €	0.00 €
				<b>III. Other Assets</b>			
				<b>Total Other Assets</b>			
					0.00 €	0.00 €	0.00 €
				<b>Total Assets</b>			
					350,154.75 €	419,346.66 €	449,238.51 €



**ERC OFTAC**  
**Income Statement**  
**From January 1st, 2009 to December 31th, 2009**

		<b>2009</b>	
<b>I. Revenue</b>			
ERC OFTAC	Research Subscription	73,500.00 €	149 members
	Industry Subscription	40,500.00 €	42 members (3 SME)
	Associated Subscription	500.00 €	1 member
	National Research Center	500.00 €	
	Past adjustments	<u>-2,000.00 €</u>	
		113,000.00 €	
	<b><u>SEMINAR</u></b>		
	RANS-LES	22,179.01 €	
	AMC	1,790.00 €	
	Microfluidics and Microheat	2,490.00 €	
	Multiphase flow	<u>4,050.00 €</u>	
		30,509.01 €	
	<b><u>ETMM8</u></b>	25,150.00 €	
	<b><u>PROJET</u></b>		
	Aerochina	2,768.30 €	
	E-CAERO	12,000.00 €	
	<b>Q&amp;T</b>		
	Q&T BPG1	2,288.00 €	
	Q&T BPG2	3,770.00 €	
	Q&T Postage and delivery	619.35 €	
	Q&T Credit card payment	<u>140.20 €</u>	
		6,817.55 €	
<b>Gross Profit</b>			<b>190,244.86 €</b>
<b>II. Expenses</b>			
ERC OFTAC	<b><u>ADMINISTRATION</u></b>		
	Eccomas Membership	1,000.00 €	
	Chairman Budget	3,147.26 €	
	Coordination Center Budget	37,500.00 €	
	ADO Budget	26,044.04 €	
	Travel expenses	1,172.44 €	
	Legal Publications	-103.70 €	
	Office Supplies	2,226.97 €	
	Site Web Création et Maintenance	<u>15,531.79 €</u>	
		86,518.80 €	
	<b><u>SEMINAR</u></b>		
	AMC	2,670.44 €	
	Da vinci Award	7,928.91 €	
	MICRO	1,770.68 €	
	MULTI	3,231.73 €	
	RANS expenses	<u>18,997.07 €</u>	
		34,598.83 €	
	<b><u>ETMM8</u></b>	9,011.50 €	
	<b><u>WORKSHOP</u></b>		
	Workshop 2009	6,000.00 €	
	Workshop 2008	<u>-2,442.62 €</u>	
		3,557.38 €	
	<b><u>SUMMERSCHOOL</u></b>		
	Summerschool 2009	3,000.00 €	
	<b><u>SIG</u></b>		
	SIG	13,306.02 €	
	<b><u>BUSINESS PLAN</u></b>		
	Business Plan & Consulting	5,381.42 €	
	<b><u>PROJET</u></b>		
	E-ECARO	711.66 €	
	<b><u>IEO Salaries</u></b>	42,939.94 €	
	<b>Q&amp;T</b>		
	2 <sup>nd</sup> BPG Edition	6,144.72 €	
	Postage & delivery	0.00 €	
	Credit card	189.67 €	
	Support for QNET data base	<u>20,697.56 €</u>	
		27,031.95 €	
<b>Total Expenses</b>			<b>226,057.50 €</b>
<b>Net Operating Loss</b>			<b>-35,812.64 €</b>
<b>III. Financial result</b>			
<b>Income:</b>			
	Interest Income AIBS	9,172.22 €	
	Interest Income Q&T	1,732.67 €	
	Interest ETMM	45.39 €	
<b>Expenses:</b>			
	Financial costs	5,062.25 €	
	Financial costs Q&T	532.18 €	
	Financial costs ETMM	78.75 €	
<b>Total Financial Result</b>			<b>5,277.10 €</b>
<b>Net Income (Loss) AIBS</b>			<b>25,524.78 €</b>
<b>Net Income (Loss) Industrial Related Activities</b>			<b>-56,059.82 €</b>
<b>TOTAL Net Income</b>			<b>-30,535.04 €</b>

## Explanation about Income Statement 2009

### I. Revenue

- Research members  
ERCOFTAC counts 149 members. We have booked 4 cancellations and we have 10 new members.
- Industry members  
ERCOFTAC counts 42 members. We have booked 7 cancellations and we have 3 new members.
- Past adjustments – Cancellation membership
  - R-UK-27                      500 € - cancellation
  - R-UK-07                      500 € - cancellation
  - I-D-09                         1000 €- cancellation

### II. Expenditure

- Chairman Budget
 

Spring Festival Budapest & EUCCASS Conference	1792,62 €
Autumn Festival – Hybrid RANS/LES (October 2008)	1354,64 €
TU Darmstadt –seminar on ERCOFTAC Knowledge Base	
- TOTAL Website **15.531,79 €**
  - Andrey Babayan                      2.500,00 €
  - Andrey Babayan                      2.500,00 €
  - DUODESIGN                            2.806,71 €
  - DUODESIGN                            2.795,49 €
  - DUODESIGN                            3.340,75 €
  - DUODESIGN                            1.572,20 €
  - 16, 64 €
- Eccomas Membership                      1.000,00 €
- Travel Spring Festival – M. Leschziner                      691,46 €
- Travel Autumn Festival – M. Leschziner                      480.48 €

• Travel E- Caero-Barcelona	711,66 €
• TOTAL Office supplies	<b>2 123,27 €</b>
- Office furniture	1687,42 €
- Computer supplies	488,45 €
- Telephone	51,10 €
- Legal publications	-103,70 €

## PAYROLL BREAKDOWN

### FIGURES in £ STERLING 2008

Month	Gross	Tax	EmpleeNI	Sal. Net	EmpyrNI	HMRC	SALARY COST
Avril	2833,33	476	261,84	2095,49	304,68	1042,52	3138,01
Mai	2833,33	476	261,84	2095,49	304,68	1042,52	3138,01
Juin	2833,33	476	261,84	2095,49	304,68	1042,52	3138,01
Juillet	2833,33	476	261,84	2095,49	304,68	1042,52	3138,01
Août	2833,33	476	261,84	2095,49	304,68	1042,52	3138,01
Septembre	2833,33	416	261,84	2155,49	304,68	982,52	3138,01
Octobre	2833,33	466	261,84	2105,49	304,68	1032,52	3138,01
Novembre	2833,33	466	261,84	2105,49	304,68	1032,52	3138,01
Décembre	2833,33	466	261,84	2105,49	304,68	1032,52	3138,01
	<b>25.499,97</b>	<b>4.194,00</b>	<b>2.356,56</b>	<b>18.949,41</b>	<b>2.742,12</b>	<b>9.292,68</b>	<b>28.242,09</b>

### 2009

Month	Gross	Tax	EmpleeNI	Sal. Net	EmpyrNI	HMRC	SALARY COST
Janvier	2833,33	466	261,84	2105,49	304,68	1032,52	3138,01
Février	2833,33	466	261,84	2105,49	304,68	1032,52	3138,01
Mars	2833,33	466	261,84	2105,49	304,68	1032,52	3138,01
Avril	2833,33	458,6	259,31	2115,42	301,74	1019,65	3135,07
Mai	2946,67	481,4	271,77	2193,50	316,24	1069,41	3262,91
Juin	2890,00	470	265,54	2154,46	308,99	1044,53	3198,99
Juillet	2890,00	470	265,54	2154,46	308,99	1044,53	3198,99
Août	2890,00	470	265,54	2154,46	308,99	1044,53	3198,99
Septembre	2890,00	470	265,54	2154,46	308,99	1044,53	3198,99
Octobre	2890,00	470	265,54	2154,46	308,99	1044,53	3198,99
Novembre	2890,00	470	265,54	2154,46	308,99	1044,53	3198,99
Décembre	2890,00	470	265,54	2154,46	308,99	1044,53	3198,99
	<b>34.509,99</b>	<b>5.628,00</b>	<b>3.175,38</b>	<b>25.706,61</b>	<b>3.694,95</b>	<b>12.498,33</b>	<b>38.204,94</b>

## Breakdown for Hybrid Rans-Les Methods for Industrial Methods Overview, Guidance and Examples (2-3 June 2009)

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### INCOME - Hybrid Rans

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10/03/2009	FV01	C RANS	1280,00 €	Deutsches Zentrum fuer Luft – M. Di Domenico
10/03/2009	FV02	C RANS	640,00 €	Volkswagen AG – Hardy Schmidt
20/03/2009	FV03	C RANS	640,00 €	Volkswagen AG – Uwe Görn
16/04/2009	FV04	C RANS	640,00 €	Voith Hydro- Holding GmbH – Roland Jester Silesian University of Technology – Krzysztof
27/04/2009	FV05	C RANS	640,00 €	Bochon
27/04/2009	FV06	C RANS	640,00 €	Volkswagen AG – Gerd Rapin
7/05/2009	FV07	C RANS	640,00 €	SNPE Matériaux Energétiques – Stany Gallier
7/05/2009	FV08	C RANS	640,00 €	Geschäftsführender Direktor – Peter Farber
7/05/2009	FV09	C RANS	640,00 €	Registrations Manager – C. Bonilla
19/05/2009	FV10	C RANS	640,00 €	FNB – Prof. Shaefer
20/05/2009	FV11	C RANS	995,00 €	ALSTOM Power Sweden – Carmen Tabikh
20/05/2009	FV12	C RANS	640,00 €	University of Maribor – Janez Lupse
25/05/2009	FV13	C RANS	570,00 €	Viessmann Werke GmbH – Claudia Glöser
25/05/2009	FV14	C RANS	640,00 €	Universität of Stuttgart – Alexander Klein
25/05/2009	FV15	C RANS	640,00 €	Universität Karlsruhe – M. Hettel
26/05/2009	FV16	C RANS	640,00 €	Technische Universität München – Rohit Kulkarni
26/05/2009	FV17	C RANS	640,00€	BB&J Consulting – Jan Patrice Simoneau Institute for Turbomachinery and Fluid Dynamics
26/05/2009	FV18	C RANS	640,00€	Nina Huwald
3/06/2009	FV19	C RANS	640,00€	CEA-Saclay – Magnaud Jean-Paul
			<b>13.085,00 €</b>	

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### EXPENDITURE - Hybrid Rans Les

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01/02/2009	A1	F SEOUD	51,10€	50 Copies
16/06/2009	A1	F SEOUD	971,04€	Catering
17/06/2009	A1	F SEOUD	1468,58€	Catering
18/06/2009	A1	F SEOUD	1093,61€	Travel Costs – Richard Seoud
18/06/2009	A1	F SEOUD	802,00€	Advertising
05/06/2009	A1	F SEOUD	594,53€	Travel Costs – Prof. Geurts

19/06/2009	A1	F SEOUD	475,00 €	Honorarium – Prof. Geurts
08/06/2009	A1	F SEOUD	448,80€	Travel Costs – Mr. Leschziner
19/06/2009	A1	F SEOUD	475,00€	Honorarium – Mr. Leschziner
19/06/2009	A1	F SEOUD	260,00€	Travel Costs – Dr. Von Terzi
19/06/2009	A1	F SEOUD	475,00€	Honorarium – Dr. Von Terzi
19/06/2009	A1	F SEOUD	900,00€	Honorarium – Mr. Mockett
19/06/2009	A1	F SEOUD	536,00€	Travel Costs – Misha Strelets
19/06/2009	A1	F SEOUD	475,00€	Honorarium – Misha Strelets
19/06/2009	A1	F SEOUD	475,00€	Honorarium – Dr. Menter
			<b>9.500.66€</b>	

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**NET RESULT**

**3.584,34 €**

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**Breakdown for Hybrid Rans-Les Methods for Industrial CFD  
(16-17 November 2009)**

<b>INCOME - Hybrid Rans</b>					
12/10/2009	FV01	1	C RANS	640,00 €	Lulea University of Technology – Sofia Larsson
13/10/2009	FV02	2	C RANS	995,00 €	FORCE Technology Norway – Aoudou Midjiyawa
19/10/2009	FV03	3	C RANS	640,00 €	Vattenfall R&D – Jens Madsen
28/10/2009	FV04	4	C RANS	995,00 €	INTA – Sonia Salcedo
28/10/2009	FV05	5	C RANS	640,00 €	Fortum Nuclear Services – Tellervo Brandt
28/10/2009	FV06	6	C RANS	640,00 €	Fortum Nuclear Services – Tommi Rama
28/10/2009	FV07	7	C RANS	640,00 €	TNO – Aris Twerda
2/11/2009	FV08	8	C RANS	995,00 €	COMSOL AB – Christian Wollblad
2/11/2009	FV09	9	C RANS	640,00 €	Kungliga Tekniska Högskolan – Tomas Muld
4/11/2009	FV10	11	C RANS	350,00 €	Vattenfall R&D – Ylva Odemark
10/11/2009	FV11	13	C RANS	640,00 €	Universität Stuttgart – Armin Zirkel
10/11/2009	FV12	14	C RANS	640,00 €	Universität Stuttgart – David Klören
10/11/2009	FV13	15	C RANS	512,00 €	Elisabeth Gren
				<b>8.967,00 €</b>	
<b>EXPENDITURE - Hybrid Rans Les</b>					
17/11/2009	A1		F SEOUD	604.90€	Travel Costs - Mikhail Strelets
17/11/2009	A1		F SEOUD	600.00€	Honorarium - Mikhail Strelets
17/11/2009	A1		F SEOUD	670.98€	Travel Costs - M.Leschziner
17/11/2009	A1		F SEOUD	600.00€	Honorarium – M. Leschziner
17/11/2009	A1		F SEOUD	500.00€	Honorarium – Prof. Shia Hui
17/11/2009	A1		F SEOUD	908.17€	Travel Costs – Richard Seoud
17/11/2009	A1		F SEOUD	733.88€	Catering – Richard Seoud
17/11/2009	A1		F SEOUD	743.33€	Booklets – Richard Seoud
17/11/2009	A1		F SEOUD	743.31€	Travel Costs– Bernard Geurts
01/12/2009	A1		F SEOUD	500.00€	Honorarium – Bernard Geurts
01/12/2009	A1		F SEOUD	886.29€	Travel Costs – Dominci Von Terzi
01/12/2009	A1		F SEOUD	500.00€	Honorarium – Dominci Von Terzi
01/12/2009	A1		F SEOUD	660.55€	Travel Costs – Charles Mockett
01/12/2009	A1		F SEOUD	600.00 €	Honorarium – Charles Mockett
				<b>9.251.41€</b>	
<b>NET RESULT</b>				<b>-284,41€</b>	



## BREAKDOWN HYBRID RANS-LES (21-22 October 2008)

### **INCOME - Hybrid Rans Les**

25/08/2008	FV4	1	C RANS	8.496,84 €	Manpower 8*560 pounds sigrit altmaee
11/09/2008	FV4	2	C RANS	695,26 €	Nuclear energy safety -Simon kulin
11/09/2008	FV4	3	C RANS	1.395,00 €	Ghent university -Erik Dick
11/09/2008	FV4	4	C RANS	186,23 €	PCA Peugeot citroen
19/09/2008	FV4	5	C RANS	695,26 €	Rwth Aachen D. Christ
24/09/2008	FV4	6	C RANS	1.055,30 €	Viajes el corte ingles - Fernando Gisbert
24/09/2008	FV4	7	C RANS	695,26 €	Cenaero - Severine Quinet
24/09/2008	FV4	8	C RANS	1.055,30 €	Rwe npower - Tara Scarr
24/09/2008	FV4	9	C RANS	1.055,30 €	Gustav B. V - Titia Mooi
30/09/2008	FV4	11	C RANS	695,26 €	Rolling metal strips - Jochem Groot
2/10/2008	FV4	13	C RANS	704,91 €	Lehrstuhl fur aerodynamik Technische universitat
2/10/2008	FV4	14	C RANS	704,91 €	Renuda - Tonello
8/10/2008	FV4	15	C RANS	704,91 €	GRS - Astrid Wankum
9/10/2008	FV4	16	C RANS	1.069,95 €	EADS learning shared services - caolina fresno sanc
13/10/2008	FV4	17	C RANS	704,91 €	Hemley fraser group milited -Hemsley Fraser
14/10/2008	FV4	18	C RANS	1.069,95 €	Alstom Power Technology -Lisa Marie Dilley
02/03/2009			G 5500	127,01 €	Copy of course materials to health and safety lab.
				<b>21.111,56 €</b>	

### **EXPENDITURE - Hybrid Rans Les**

26/11/2008	A1	853	F SEOUD	1.826,26 €	Catering & printing
1/12/2008	A1	857	F RANS	5.693,76 €	Travel Costs & Honorarium Speakers
22/01/2009	A1		FTECHNOLOG	245,00€	Travel Costs – A. Tomboulies
				<b>7.765.02 €</b>	

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**NET RESULT** **13.346,54 €**

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## Advances in Mixing and Combustion (8th April 2009)

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### INCOME - AMC

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2/02/2009	FV01	170,00 €	Computational Dynamics Limited – S. Duranti
2/02/2009	FV02	260,00 €	Corporate Technology – Andreas Hauser
20/02/2009	FV03	340,00 €	German Aerospace Center – Berthold Noll
25/02/2009	FV04	170,00 €	Lehrstuhl fuer Stroemungsmechanik - Rogg
4/03/2009	FV05	170,00 €	Viessmann Werke GmbH – V. Pawlik
10/03/2009	FV06	340,00 €	ETH – Christos Frouzakis
10/03/2009	FV07	170,00 €	Oel-Waerme- Institut GmbH– T. Hermanns
10/04/2009	FV08	170,00 €	University of Macedonia – Pericles Papanikolaou
		<b>1.790,00 €</b>	

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### EXPENDITURE - AMC

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04/06/2009	A1	F SEOUD	415,60€	Honorarium speaker - McGuirk
30/04/2009	A1	F TECHNOLOG	337,50€	Honorarium speaker - Vassilicos
30/04/2009	A1	F TECHNOLOG	297,00€	Honorarium speaker - Tomboulides
31/03/2009	A1	F GEGLOBAL	117,18€	Travel expenses
30/04/2009	A1	F SEOUD	228.62	Travel expenses
01/05/2009	A1	F SEOUD	561,68€	Catering
04/05/2009	A1	F SEOUD	357,00€	Catering
30/04/2009	A1	F SEOUD	355.86€	Fourniture
			<b>2.670,44 €</b>	

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### NET RESULT

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**-880,44 €**

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### ACCOUNTS RECEIVABLE - Payment to be received - April 15<sup>th</sup> 2009

04/03/2009	5	C AMC	170,00€	Viessmann werke GmbH & Co KG
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## Microfluidics and Microheat (11<sup>th</sup> November 2009)

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### INCOME - MICRO

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08/10/2009	FV01	1	170,00 €	Eindhoven University of Technology – M. Speetjens
12/10/2009	FV02	2	170,00 €	Aalborg University – Alireza Rezaia
12/10/2009	FV03	3	260,00 €	Wolverine LDA – Jesus Moreno
12/10/2009	FV04	4	170,00 €	Politecnico di Milano – Elena Bianchi
12/10/2009	FV05	5	170,00 €	Politecnico di Milano – Francesca Nason
19/10/2009	FV06	6	170,00 €	University of Twente – Elizaveta Vereshchagina
19/10/2009	FV07	7	170,00 €	Technische Universiteit Eindhoven – Badr Kaoui
19/10/2009	FV08	8	260,00 €	ASML – Martin Remie
19/10/2009	FV09	9	260,00 €	ASML – Hein Castelijns
28/10/2009	FV10	11	170,00 €	Katholieke Universiteit Leuven – Yegermal Atalay
02/11/2009	FV11	13	260,00 €	Dantec Dynamics A/S – Per Petersson
04/11/2009	FV12	14	260,00 €	Philips Electronics – Toon Kuijpers
			<b>2490,00 €</b>	

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### EXPENDITURE - MICRO

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17/11/2009	A1	F SEOUD	618.21€	Travel
17/11/2009	A1	F SEOUD	243.80€	Travel – Cahrels Baroud
17/11/2009	A1	F SEOUD	279.00 €	Printing - Seoud
17/11/2009	A1	F SEOUD	629.67 €	Travel - Seoud
			<b>1.770,68 €</b>	

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**NET RESULT** **719,32€**

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### ACCOUNTS RECEIVABLE - Payment to be received

04/11/2009	12	C MICRO	260,00€	Philips Electronics NL BV
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**Seminar Multi-Phase Flow  
(16th October 2009)**

<b>INCOME - MULTI</b>				
24/09/2009	FV01		570,00 €	GE Infra, Oil & Gas – Massimiliano Cirri
24/09/2009	FV02		270,00 €	ENEA, C.R. Casaccia – Eugenio Giacomazzi
24/09/2009	FV03		270,00 €	ENEA, C.R. Casaccia – F. Pichhia
24/09/2009	FV04		190,00 €	German Aerospace Center – Daniel Banuti
24/09/2009	FV05		190,00 €	University of Zagreb – Hrvoje Mikulcic
24/09/2009	FV06		190,00 €	ETH-Zentrum – Anna Kubik
24/09/2009	FV07		190,00 €	LIMSI UPR CNRS – Joao Pinto
24/09/2009	FV08		190,00 €	GE Global Research – Emad Graraibah
05/10/2009	FV09		190,00 €	SNPE – Stany Gallier
05/10/2009	FV10		190,00 €	Austrian Institute of Technology – Peter Benovsky
05/10/2009	FV11		190,00 €	Leibniz University Hannover – Thomas Kwitschinski
05/10/2009	FV12		190,00 €	Universita di Roma “ Tor Vergata” – Giovanna de Simone
08/10/2009	FV13		270,00 €	Dipartimento di Ingegneria Chimica dei Processi – Antonio Busciglio
12/10/2009	FV14		270,00 €	Dipartimento di Ingegneria Chimica dei Processi – Alessandro Tamburini
13/10/2009	FV15		270,00 €	Vetco Gray Scandinavia AS – Astrid Kristoffersen
19/10/2009	FV16		270,00 €	Politecnico di Milano – Fabio Inzoli
19/10/2009	FV17		150,00 €	Dip. Energetica e Macchinne – Cristian Marchioli
			<b>4050,00 €</b>	
<b>EXPENDITURE - MULTI</b>				
17/11/2009	A1	F SEOUD	1.250,00€	Organisateur – Martelli Franscesco
17/11/2009	A1	F SEOUD	59.76€	Printing – R. Seoud
17/11/2009	A1	F SEOUD	625.42€	Travel – R. Seoud
30/11/2009	A1	F SEOUD	859.92€	Travel – Martin Sommerfeld
30/11/2009	A1	F SEOUD	436.60€	Travel - Berend Van Wachem
			<b>3.231.73€</b>	
<b>NET RESULT</b>			<b>818.27€</b>	

**ACCOUNTS RECEIVABLE - Payment to be received**

01/10/2009	15	MULTI	270,00€	Astrid Rusas Kristoffersen
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## EXPENDITURE BUSINESS PLAN

**From 1<sup>st</sup> January 2009 to 31<sup>th</sup> December 2009**

### Travel Expenses

01/02/2009	A1	F SEOUD	165,78 €	Nafems Aerospace – Richard Seoud
01/02/2009	A1	F SEOUD	238,10 €	Horizon 10 – Richard Seoud
01/02/2009	A1	F SEOUD	155.44 €	Horizon 10 – Richard Seoud
30/04/2009	A1	F SEOUD	499.85 €	Spring Festival – Richard Seoud
01/05/2009	A1	F SEOUD	145,04 €	Spring Festival – Richard Seoud
29/08/2009	A1	F LEA	481.06 €	Spring Festival – Chris Lea
01/10/2009	A1	F SEOUD	89,71 €	Bae Systems – Richard Seoud
16/06/2009	A1	F SEOUD	80,78€	Imperial College – Richard Seoud
18/06/2009	A1	F SEOUD	181,14€	Osbourne Reynolds BAE – Richard Seoud
01/08/2009	A1	F SEOUD	72.63€	Redain Trip - Ms. Hutton
10/11/2009	A1	F HUTTONSAR	76.00€	London - Sarah Hutton
30/04/2009	A1	F SEOUD	210,82€	Nafems Seminar – Richard Seoud
	A1	F SEOUD	686,60 €	Autumn Festival - Richard Seoud
			<b>3082.95€</b>	

### IEOSA

10/11/2009	A1	F HUTTON	250,00 €	IEOSA Consulting
17/11/2009	A1	F HUTTON	250,00 €	IEOSA Consulting
01/12/2009	A1	F HUTTON	250,00€	IEOSA Consulting
			<b>750.00€</b>	

### Business Plan

06/02/2009	A1	F LEA	386,05€	IEO Management
29/08/2009	A1	F LEA	1162.42€	IEO Management
			<b>1548.47€</b>	

## BREAKDOWN 2009 DA VINCI AWARD

### INCOME

0,00 €

### EXPENDITURE

Travel Finalist – Hardy Reiseburo + Grundmann	1.169,51 €
Hotel Finalist	1.064,80 €
Travel Finalist – Sven Grundmann	211,27 €
Travel Finalist – Angela Ferrari	627,11 €
Travel Finalist – Florian Schwertfirm	363,66 €
Travel Finalist – Benjamin Boehm	529,00 €
Travel Finalist – Jeroen Witteveen	990,07 €
Medal 2009	972,24 €
Price Winner 2009	1.000,00 €
Price Winner 2008	1.000,00 €
Award furniture	1.25 €

### NET RESULT

**-7928.91€**

**ETMM8 - Marseille**  
**From 1<sup>st</sup> January 2008 to 31<sup>th</sup> December 2009**

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**INCOME - ETMM8**

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05/08/2009	FV01	5000,00 €	EDF R&D – Isabelle Dantas
24/09/2009	FV03	1150,00 €	Software Cradle – Ichiro Komada
24/09/2009	FV04	3000,00 €	Delft University of Technology – Ilse Hoekstein
29/10/2009	FV05	2000,00 €	IFP – Philippe Ungerer
04/11/2009	FV06	3000,00 €	IRNS – Michel Schwarz
10/11/2009	FV07	5000,00 €	Centre DAM – Jean François Haas
18/11/2009	FV08	1000,00 €	NUMECA – Charles Hirsch
30/12/2009	FV09	5000,00 €	AIRBUS – Eric Chaput
		<b>25 150,00 €</b>	

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**EXPENDITURE - ETMM8**

01/01/08 to 31/12/2008		1680.57€	M. Leschziner	
01/01 to				
31/12/2009	A1	ATOUT	8161.52€	Partial Payment
01/06/2009	A1	LESCHZINER	353.77€	5000 copies
31/08/2009	A1	LESCHZINER	496.21€	Travel Costs Marseille – M. Leschziner
			<b>10 691,99 €</b>	

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**NET RESULT**

**14 458.01 €**

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**ACCOUNTS RECEIVABLE on 30/04/2010**

28/08/2008	OD1	50,00€	Prof Song Fu
04/11/2009	FV6	3.000,00€	IRSN – Direction Scientifique
10/11/2009	FV7	5.000,00€	CEA
		<b>8.050,00€</b>	

## ETMM7

From 1<sup>st</sup> January 2007 to 31<sup>th</sup> December 2008

INCOME		37 793.53 €
EXPENDITURE	ETMM7	28 214.92 €
<hr/>		
NET RESULT		9 578.61 €



## SIG

**From 1<sup>st</sup> January 2007 to 31<sup>th</sup> December 2009**

<b>SIG BUDGET</b>	SIG 12	SIG 15	SIG 20	SIG 28	SIG 34	SIG 35	SIG 40	SIG 42
2007	3.000 €	3.000 €	3.000 €	3.000 €	3.000 €	3.000 €	3.000 €	0 €
2008	3.000 €	3.000 €	3.000 €	3.000 €	0 €	3.000 €	0 €	0 €
2009	3.000 €	3.000 €	3.000 €	3.000 €	0 €	3.000 €	0 €	3.000 €
	<b>9.000 €</b>	<b>9.000 €</b>	<b>9.000 €</b>	<b>9.000 €</b>	<b>3.000 €</b>	<b>9.000 €</b>	<b>3.000 €</b>	<b>3.000 €</b>

<b>SIG EXPENSES</b>	SIG 12	SIG 15	SIG 20	SIG 28	SIG 35	SIG 40	SIG 42	SIG 43
2007	1.071 €					1.511 €	979 €	
2008						1.340 €		
2009	1.805,13€	1.270,46€	1.907,39€	830,92€	2.974,90€		3.000,00€	1517,22€
	<b>2.876,13€</b>	<b>1.270,46€</b>	<b>1.907,39€</b>	<b>830,92€</b>	<b>2.974,90€</b>	<b>2.851,00€</b>	<b>3.979,00€</b>	<b>1517,22€</b>



## MEMBERS LIST

May 4th, 2010

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May 4th, 2010

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*European Research Community On Flow Turbulence And Combustion*

*Status Membership per Year*

Statement on December 31th 2009

Research Group	Number of members	Number of received payments in 2009	Received amount in 2009	Number of unpaid membership	Amounts still due
2009	149	129	63,750 €	20	9,750 €
2008	143	3	1,500 €	9	4,500 €
2007	140	1	500 €	3	1,500 €
2006	141		0 €		0 €
2005	139		0 €		0 €
2004	142		0 €		0 €
2003	138		0 €		0 €
2002	141		0 €		0 €
<b>Total</b>			<b>65,750 €</b>		<b>15,750 €</b>
Industry Group	Number of members	Number of received payments in 2009	Received amount in 2009	Number of members unpaid	Amount still due
2009	42	34	33,000 €	8	7,500 €
2008	46	42	39,250 €	3	3,000 €
2007	45		0 €	2	2,000 €
2006	44		0 €		
2005	45		0 €		
2004			0 €		
2003			0 €		
<b>Total</b>			<b>72,250 €</b>		<b>12,500 €</b>
Associated	Number of members	Number of received payments in 2009	Received amount in 2009	Number of members unpaid	Amount still due
2009	1	1	500 €		0 €
2008	1	1	500 €		0 €
2007	1		0 €		0 €
<b>Total</b>			<b>1,000 €</b>		<b>0 €</b>

**TOTAL 139,000 €**

**TOTAL 28,250 €**



*European Research Community On Flow Turbulence And Combustion*

**Unpaid Membership per Year**

Statement on December 31th 2009

Research member	Institution				
NRCD01	Forschungszentrum Karlsruhe INR	2009			
R-D-02	RWTH Aachen	2009			
R-D-27	Rostock University	2009			
R-F-15	Université de la Rochelle LEPTAB	2009			
R-F-17	CEA/SACLAY DM2S/SFME/LTMF	2009			
R-F-20	Institut Jean-Le-Rond d'Alembert	2009	2008	2007	
R-GR-02	Aristotle University of Thessalonik	2009			
R-GR-03	Aristotle University of Thessalonik	2009	2008	2007	
R-I-04	Universita di Roma La Sapienza	2009			
R-N-01	Norwegian University of Science	2009	2008		
R-P-01	Instituto Superior Tecnico	2009	2008		
R-PL-02	University of Mining and Metallurgy	2009			
R-PL-04	Institute of fluid flow Machinery Polish Academy of Sciences	2009	2008		
R-PL-06	Silesian Technical University	2009	2008		
R-PL-07	Kielce University of Technology	2009	2008		
R-S-05	LTH	2009	2008		
R-S-08	Lulea University of Technology			2007	
R-UK-06	DAMPT University of Cambridge	2009			
R-UK-16	UMIST	2009	2008		
R-UK-20	Cranfield University	2009			
R-UK-30	University of Sheffield	2009			
		<b>20</b>	<b>9</b>	<b>3</b>	
		<b>9.750 €</b>	<b>4.500 €</b>	<b>1.500 €</b>	



*European Research Community On Flow Turbulence And Combustion*

**Unpaid Membership per Year**

Statement on December 31th 2009

Industry member	Institution				
I-S-02	Volvo Aero Corporation	2009			
I-UK-01	Arup research & Development	2009	2008	2007	
I-UK-09	W.S Atkins Engineering Sciences	2009	2008	2007	
I-UK-14	Computational Dynamics	2009			
I-UK-15	Qinetiq	2009			
I-UK-18	BAE Systems advanced Technology	2009	2008		
I-UK-20	Alstom Power	2009			
I-UK-21	Renuda	2009			
		<b>8</b>	<b>3</b>	<b>2</b>	
		<b>7.500 €</b>	<b>3.000 €</b>	<b>2.000 €</b>	
<b>TOTAL in EUROS</b>		<b>17.250 €</b>	<b>7.500 €</b>	<b>3.500 €</b>	

## ***European Research Community on Flow, Turbulence and Combustion***

*Summerschools/Courses (co)-organized with ERCOFTAC*

### **SummerSchools 2009**

**INVOICES 3000 €**

- **S2009-03 – Invoice 29009 for 3000€**

#### ***Bio-fluid mechanics***

Location and date: TU Eindhoven, Netherlands, 9<sup>th</sup> - 13<sup>th</sup> March 2009

Organiser: A.A van Steenhoven, Dept. Mechanical Engineering

Co-organized: SIG37

Funding Requested: Yes

Funding Decision: Yes, 3000

Logo Requested: Yes

Logo Decision: Yes

Reviewed: Brussels, 11<sup>th</sup> 2009

**Workshops/Conferences (co)-organized with ERCOFTAC**

**Workshop 2009 Budget € - Invoices received 6000€ (2009)**

**Invoices received 2000€ (2008)**

- **W2008-11 – Invoice 29006 for 2000€**  
**4<sup>th</sup> Workshop on Synthetic Turbulence Modeling**  
Location and date: Ecole de Geology in Nancy, France, 11<sup>th</sup> – 12<sup>th</sup> December 2008  
Organizers: Dr. J-R Angilella, J-M Redondo and Dr. F. Nicolleau  
Co-organized: SIGs 35, 42  
Funding Requested: Yes  
Funding Decision: Yes, 2000  
Logo Requested: Yes  
Logo Decision: Yes  
Reviewed: Brussels, 11<sup>th</sup> 2008
- **W2009-13 – Invoice 29067 for 2000€**  
***Synthetic Turbulence and Vortex Flows***  
Location and date: Warsaw University of Technology, Poland, 1st-3<sup>rd</sup> July 2009  
Organizer: Dr. A. Nowakowski, Dr. K. Bajer, Prof. J. Rokicki, Dr. C. Cambon and Dr. F. Nicolleau  
Co-organized: SIG42, 35  
Funding Requested: Yes  
Funding Decision: Yes, 2000  
Logo Requested: Yes  
Logo Decision: Yes  
Reviewed: Budapest, 5<sup>th</sup> 2009
- **W2009-03 – Invoice 29092 for 2000€**  
***Quality & Reliability of LESS II***  
Location and date: Pisa, Italy, 9-11 September 2009  
Organizers: M. Salvetti  
Co-organized: SIG1  
Funding Requested: Yes  
Funding Decision: Yes, 2000  
Logo Requested: Yes  
Logo Decision: Yes  
Reviewed: Brussels, 11<sup>th</sup> 2008
- **W2009-12 – Invoice 29124 for 2000€**  
***Velocity Gradients and Increments, Statistics and Dynamics***  
Location and date: Ecully, France, 7<sup>th</sup> - 8<sup>th</sup> December 2009  
Organizers: A. Naso, F. Nicolleau, F. Godefert, C. Cambon  
Co-organized: SIG35  
Funding Requested: Yes  
Funding Decision: Yes, 2000  
Logo Requested: Yes  
Logo Decision: Yes  
Reviewed: Lausanne, 10<sup>th</sup> 2009

## Income Statement Quality and Trust SIG Accounts

From 1<sup>st</sup> January to 31<sup>th</sup> December 2009

### INCOME

<b>1. Sales of Best Practice Guidelines – Version 2000</b>	
29 Orders (29 BPG sold)	2 288.00 €
Post and bank charges	268.45 €
Credit card payment (14 BPG)	52.60 €
<b>2. Sales of Best Practice Guidelines – Version 2008</b>	
43 Orders (43 BPG sold)	3 960.00 €
Post and bank charges	350.90 €
Credit card payment (19 BPG)	87.60 €
<b>3. Income from interest on term account</b>	
Interests	1 732.67 €
<b>TOTAL INCOME RECEIVED</b>	<b>8 550.22 €</b>

### EXPENDITURE

<b>1. Bank charges</b>	532.18 €
<b>2. Support for QNET data base</b>	20.697,56 €
• Rodi	12.000,00 €
• ECS	2.559,73 €
• David Ellacott	6.137,83 €
<b>3. Best Practise Guide Verssion 2008</b>	6 144.72 €
• Mr. Mudde	3000.00€
• Mr.Kuipers	3000.00€
• Furniture for Books	144.72€
<b>4. Credit card payment</b>	189.67 €
<b>TOTAL EXPENDITURE</b>	<b>27 564.13 €</b>
<b>NET INCOME 2008</b>	<b>-19 013.91€</b>



## Balance Sheet Quality and Trust SIG Accounts

From 1<sup>st</sup> January to 31<sup>th</sup> December 2009

### ASSETS

#### Current Assets

##### A. Cash/ Bank Accounts.

Checking Account Q&T	8 463.11 €
Term Account Q&T	44 633.65 €

##### B. Accounts Receivable

Invoices QT 2009	-186.00 €
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<u>C. Revenue reserve account</u>	638.10 €
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**TOTAL ASSETS** **53 548.86 €**

### Liabilities and Capital

#### Current Liabilities

##### A. Revenue reserve account

Financial charges	96.31 €
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##### B. Account Payable

David Ellacott	3 386.54 €
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#### Capital

Net Result Q&T	50 066.01 €
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**TOTAL Liabilities and CAPITAL** **53 548.86€**

Brussels 30th April 2010

**Administration and Development Office (A/DO)**

**Activity report from 1<sup>st</sup> January to 31<sup>th</sup> December 2009**

**1. Membership Invoicing 2009**

The invoices 2009 have been sent at the beginning of January to all the members and have been recorded into the accounting software. Considering the increase of the reports to be made (seminars) Ado transferred the accounting from Popsy accounting software to Navision accounting software.

**2. Follow up of memberships**

Since the beginning of January, we have collected the payments for the 2009 membership fees. At this time, we are still waiting for 20 payments from the research group, for 9 payments from the industry group. Reminders have been sent by normal post and by email.

**3. Bank Account**

In June 2009, we have decided not to continue with term account because the interest rate were very low. We have decided to create a business account with a remuneration of 2.5% from June 2009 to December 2009. From December 2009 and during 6 months, the rate should be 1.25%+1% (fidelity).

**4. Quality and Trust Special interest Group**

ADO continues to administrate the BPG sales (invoicing, packaging, sending and to follow up paypal accounts. A new task has been added the set up of list of BPG's buyers.

## **5. Seminars**

Participants have been invoiced and payments related to the fourth seminars have been processed.

Hybrid RANS-LES - GE Munich Germany, June 2009

Best Practice Guidance - Multi-Phase Flow , 16th October 2009, Florence, Italy

Microfluidics and Microheat - Eindhoven , Nov 11th 2009

Hybrid RANS-LES - Stockholm, 16-17 Nov 2009

## **6. ETMM**

Sponsors for ETMM 8 have been invoiced and payments related have been processed.

## **7. Web site**

The A/DO has taken up the responsibility of the web site. Mr. Andrey Babayan is in charge of it and you will find here below the detail of what has been done.

January - December 2009 :

1. E-Shop: Product reference modification for Anne Laurent (6.01.2009)
2. LESTAC WS: small modification structure for Dr. Richard E. Seoud (9.01.2009)
3. E-mail problem for Dr. Richard E. Seoud (12.01.2009)
4. PC Iberian West: New research member for Prof. Vassilis Theofilis (15.01.2009)
5. TAS: Programme replacement for Dr. Richard E. Seoud (22.01.2009)
6. Course "Biological Fluid Mechanics" modification for Dr. Richard E. Seoud (23.01.2009)
7. IPC: Small fix for Dr. Richard E. Seoud (28.01.2009)
8. Workshop: Immersed boundary methods fix for Dr. Richard E. Seoud (29.01.2009)
9. Workshop: SIG 43, Fibre Suspension 1st Workshop for Dr. Richard E. Seoud (18.02.2009)
10. PC Poland: membership modifications for Dr. Richard E. Seoud (1 hour) (19.02.2009)
11. Workshop: SIG 43, Fibre Suspension 1st Workshop: small modifications for Dr. Richard E. Seoud (23.02.2009)

12. Course: Hybrid RANS-LES Methods for Industrial CFD for Dr. Richard E. Seoud (25.02.2009)
13. PC UK: fix coordinator for Dr. Richard E. Seoud (26.02.2009)
14. ERCOFTAC Spring Festival for Dr. Richard E. Seoud (3.03.2009)
15. Small modifications for Dr. Richard E. Seoud (3.03.2009)
16. PC UK modifications for Dr. Richard E. Seoud (16.03.2009)
17. SIG43: Workshop info update for Dr. Richard E. Seoud (2.04.2009)
18. NPC: Bulletin April 2009 for Dr. Richard E. Seoud (6.04.2009)
19. SIG43: Membership modifications for Dr. Richard E. Seoud (20.04.2009)
20. NPC13: first announcement for Dr. Richard E. Seoud (20.04.2009)
21. SIG33: Fixed problem in bulletin contribution for Dr. Richard E. Seoud (20.04.2009)
22. TYPO3 login for Dr. Richard E. Seoud (21.04.2009)
23. NPC: Membership modification for Dr. Richard E. Seoud (21.04.2009)
24. Membership form modification for Anne Laurent (22.04.2009)
25. Membership page modification for Anne Laurent (22.04.2009)
26. PC FW: Bulletin contributions for Dr. Richard E. Seoud (23.04.2009)
27. PC FW: Membership modifications for Dr. Richard E. Seoud (2 hours) (24.04.2009)
28. ETMM8 to WS & Conferences for Dr. Richard E. Seoud (5.05.2009)
29. PC FW: Connections to SIG modification for Dr. Richard E. Seoud (5.05.2009)
30. PC FW: Past technical programme for Dr. Richard E. Seoud (1 hour) (5.05.2009)
31. Past Ercoftac News and Events for Prof. Charles Hirsch (6.05.2009)
32. Spring Festival 2009 presentations for Prof. Charles Hirsch (6.05.2009)
33. AHS Meeting for Dr. Richard E. Seoud (13.05.2009)
34. SIG41 creation for Dr. Richard E. Seoud (3 hours) (14.05.2009)
35. SIG42/35: 5th Workshop on Synthetic Turbulence Models for Dr. Richard E. Seoud (18.05.2009)
36. DLES8 for Dr. Richard E. Seoud (18.05.2009)
37. DLES8 fix for Dr. Richard E. Seoud (3.06.2009)
38. ETMM8 link to official web for Dr. Richard E. Seoud (3.06.2009)
39. BPG Seminar for Dr. Richard E. Seoud (3.06.2009)
40. AHS PC → ADA PC for Dr. Richard E. Seoud (4.06.2009)
41. Iberia West PC: Membership modification and workshop announcement for Prof. Vassilis Theofilis (10.06.2009)
42. SIG12: Multiple modifications (membership, new and past events) for Dr. Richard E. Seoud (10.06.2009)
43. SIG43: new members for Dr. Richard E. Seoud (25.06.2009)
44. BPG Seminar modifications for Dr. Richard E. Seoud (25.06.2009)
45. BPG Seminar modifications for Dr. Richard E. Seoud (3.07.2009)

46. 14th ERCOFTAC SIG 15 Workshop for Dr. Richard E. Seoud (22.07.2009)
47. TAS2 Workshop for Dr. Richard E. Seoud (07.08.2009)
48. Workshop: Quality & Reliability of LES II for Dr. Richard E. Seoud (07.08.2009)
49. TAS2: link to homepage news for Dr. Richard E. Seoud (10.08.2009)
50. 4th Global Flow Instability and Control symposium update for Dr. Vassilis Theofilis (17.08.2009)
51. Autumn Festival 2009 modifications for Dr. Richard E. Seoud (17.08.2009)
52. QNET-Wiki link modification for Dr. Richard E. Seoud (16.09.2009)
53. Hybrid RANS-LES Methods for Industrial CFD update for Dr. Richard E. Seoud (16.09.2009)
54. Autumn Festival 2009 modifications for Dr. Richard E. Seoud (16.09.2009)
55. Hybrid RANS-LES Methods for Industrial CFD update for Dr. Richard E. Seoud (24.09.2009)
56. Hybrid RANS-LES Methods for Industrial CFD update for Dr. Richard E. Seoud (28.09.2009)
57. New membership form for Anne Laurent (13.10.2009)
58. QNET-Wiki link modification for Dr. Richard E. Seoud (14.10.2009)
59. A Workshop On Flow Control Methods And Applications for Dr. Richard E. Seoud (19.10.2009)
60. Modification of 12th Workshop On Two-Phase Flow Predictions for Dr. Richard E. Seoud (27.10.2009)
61. Modification of SIG12 membership Predictions for Dr. Richard E. Seoud (27.10.2009)
62. MUSAF Colloquium form for Anne Laurent (4.11.2009)
63. SIG43 Past Technical Programme modification for Prof. Charles Hirsch (17/11/2009)
64. Problem with headers from Chris Lea (04/12/2009)
65. 5 answers on different questions (membership, etc. )

### **8. Request of increase for the budget of ERCFOTAC ADO Office**

Since 2004, new tasks have been taken up by ERCOFTAC ADO, not initially foreseen

- Increase of number of reports and listings and accounting entries, e-mails
- The sales of the BPG's
- The support and accounting for ERCOFTAC seminars
- Support to Autumn festival
- European Project – budget and cost statements
- Accounting related to payroll for Richard Seoud

	<b>From Year 2004 to Year 2009</b>	<b>Year 2010</b>
<b><u>1-1 Personnel Costs</u></b>	1.5 days/week	2.5 days /week
Cost/day with social charges	213.00 €	178.72 €
day/week	13,419.00 €	18,765.96 €
Overheads Numeca including Office space, phone, fax	12,077.10 €	16,889.36 €
<b>Total personnel Costs</b>	<b>25,496.10 €</b>	<b>35,655.32 €</b>
<b><u>1-2 Travel Costs</u></b>	1,500.00 €	1,500.00 €
<b><u>Total Budget/year</u></b>	<b>26,996.10 €</b>	<b>37,155.32 €</b>

Current Budget 26 000€

New Requested Budget 37 000€

## **9. Suggestions and Actions to be taken**

- Concerning SIG, ERCOFTAC ADO would like to know if grants have been attributed for 2010.
- Concerning ETMM8, Mr. Leschziner should contact CEA and IRSN concerning the payment of sponsoring.
- ERCOFTAC ADO changed for a new software called Navision.
- A new secretary has been hired by NUMECA. Emile Jean will be in charge of ERCOFTAC. Anne Laurent will only keep account statement for ERCOFTAC managing board.
- Concerning BPG, ADO would like to
  - receive the new price 's list for the both BPG's
  - know if price of postage has been included into the website
  - know when the new website will be opened
- Suggestions concerning membership unpaid:

### 1. To cancel the membership:

#### ACADEMIC MEMBERS

R-PL-04 Institute of Fluid Flow machinery Polish Academy of Science (2008,2009,2010)

R-PL-07 Kielce University of Technology (2008, 2009, 2010)

R-UK-16 UMIST (2008, 2009, 2010)

#### INDUSTRY MEMBERS

I-UK-01 Arup Research & Development (2007, 2008, 2009, 2010) – To See with Richard Seoud

I-UK-09 W.S Atkins Engineering Sciences (2007, 2008, 2009, 2010)

I-UK-18 BAE Systems Advanced Technology (2008, 2009, 2010)

### 2. To cancel the debts

#### ACADEMIC MEMBERS

R-I-04 Universitat di Roma La Sapienza (2009)

R-P-01 Institut Superior Technico (2008)

R-S-08 Lulea university of technology (2007)

**10. ERCOFTAC ADO - New Address**

Please note that from June 21, 2010, the ERCOFTAC Administration and Development Office will be transferred to the following address:

ERCOFTAC A/D Office  
187- 189 Chaussée de la Hulpe  
1170 Brussels  
Belgium  
Phone: +32 2 643 35 72  
Fax: +32 2 647 93 98  
[ado@ercoftac.be](mailto:ado@ercoftac.be)



Tous les montants sont en EUR.

	2010	2009
<b>REVENUE</b>	<b>183,430.97</b>	<b>201,195.14</b>
<b>1.SUBSCRIPTION</b>	<b>120,500.00</b>	<b>113,000.00</b>
Research Members	76,500.00	73,500.00
Industry Members	41,500.00	40,500.00
<i>Large Entreprises</i>	40,000.00	39,000.00
<i>Small Entreprises</i>	1,500.00	1,500.00
National Research Centers Members	2,000.00	500.00
Associated Members	500.00	500.00
Past Adjustments		-2,000.00
<b>2. ETMM</b>	<b>2,500.00</b>	<b>25,150.00</b>
ETMM8	2,500.00	25,150.00
<b>3. GRANTS</b>		<b>2,768.30</b>
European Project - Aerochina		2,768.30
<b>4. INDUSTRIAL RELATED ACTIVITIES</b>	<b>60,430.97</b>	<b>60,276.84</b>
<b>4.1 BEST PRACTICE GUIDELINE</b>	<b>2,491.80</b>	<b>6,817.55</b>
Single-Phase Flows	1,182.00	2,614.14
Dispersed Multi-Phase Flows	1,309.80	4,203.41
<b>4.2 SEMINARS</b>	<b>15,840.00</b>	<b>30,509.01</b>
Advances in Mixing and Combustion		1,790.00
Autumn Festival		
Best Practice for Engineering CFD		
Dispersed Multi-Phase Flows		4,050.00
Flow Control Technologies		
Hybrid RANS-LES Methods For Industrial	15,840.00	22,179.01
Microfluidics and Microheat		2,490.00
Uncertainty Quantification in Design & Simulation		
<b>4.3 PROJECTS</b>	<b>42,000.00</b>	<b>12,000.00</b>
European Project E-CAERO	42,000.00	12,000.00
<b>5. FINANCIAL</b>	<b>99.17</b>	<b>10,950.28</b>
Interest/ Exchange rate form Banks accounts	99.17	10,950.28

Tous les montants sont en EUR.

	2010	2009
<b>EXPENDITURE</b>	<b>-31,763.08</b>	<b>-231,730.18</b>
<b>1. ADMINISTRATION</b>	<b>-3,337.50</b>	<b>-86,518.62</b>
Chairman		-3,147.26
Coordination Center		-37,500.00
Administration Office		-26,044.04
Office Supplies	-87.50	-2,226.97
Legal Publications		103.70
Website Maintenance	-1,250.00	-15,531.79
Eccomas membership	-2,000.00	-1,000.00
Travel expenses		-1,172.26
<b>2. ETMM</b>	<b>-24,488.25</b>	<b>-9,011.50</b>
ETMM8	-24,488.25	-9,011.50
<b>3. WORKSHOPS</b>	<b>-1,736.50</b>	<b>-3,557.38</b>
<b>4. SUMMERSCHOOL</b>		<b>-3,000.00</b>
<b>5. SPECIAL INTEREST GROUPS</b>		<b>-13,306.02</b>
<b>6. INDUSTRIAL RELATED ACTIVITIES</b>	<b>-2,200.83</b>	<b>-116,336.66</b>
<b>6.1 BEST PRACTICE GUIDE LINE</b>		<b>-6,334.39</b>
Authors Fees		-6,000.00
Furniture		-144.72
Credit Card Payment		-189.67
Postage & Delivery		
<b>6.2 KNOWLEDGE BASE</b>		<b>-20,697.56</b>
Knowledge Base Consulting		-20,697.56
<b>6.3 SEMINARS</b>		<b>-34,598.83</b>
Advances in Mixing and Combustion		-2,670.44
Autumn Festival - DA VINCI		-7,928.91
Dispersed Multi-Phase Flows		-3,231.73
Hybrid RANS- LES		-18,997.07
Microfluidics and Microheat		-1,770.68
<b>6.4 PROJECTS</b>		<b>711.66</b>
European Project E-CAERO		-711.66
<b>6.5 BUSINESS PLAN</b>	<b>-1,690.03</b>	<b>-5,381.42</b>
Consulting & Travel - Sarah Hutton	-500.00	-826.00
Consulting & Travel - Chris Lea	-1,128.24	-2,029.53
Travel - Richard Seoud	-61.79	-2,525.89
<b>6.6 Payroll IEO</b>		<b>-42,939.94</b>
Salaries Richard Seoud		-42,939.94
<b>7. FINANCIAL COSTS</b>	<b>510.80</b>	<b>5,672.86</b>
Financials Costs	-510.80	-5,672.86
<b>NET INCOME (LOSS)</b>	<b>151,667.89</b>	<b>-30,535.04</b>
<i>NET INCOME (Revenue 1 to 3 - Expenditure 1 to 5)</i>	<i>93,437.75</i>	<i>25,524.78</i>
<i>NET INCOME ACTIVITIES RELATED TO INDUSTRY</i>	<i>58,230.14</i>	<i>-56,059.82</i>

Tous les montants sont en EUR.

## Budget 2010

<b>REVENUE</b>	<b>218,600.00</b>
<b>1.SUBSCRIPTION</b>	<b>122,500.00</b>
Research Members	77,000.00
Industry Members	43,000.00
<i>Large Entreprises</i>	<i>41,500.00</i>
<i>Small Entreprises</i>	<i>1,500.00</i>
National Research Centers Members	2,000.00
Associated Members	500.00
Past Adjustments	
<b>2. ETMM</b>	<b>12,500.00</b>
ETMM8	12,500.00
<b>3. GRANTS</b>	
European Project - Aerochina	
<b>4. INDUSTRIAL RELATED ACTIVITIES</b>	<b>83,600.00</b>
<b>4.1 BEST PRACTICE GUIDELINE</b>	<b>5,600.00</b>
Single-Phase Flows	2,300.00
Dispersed Multi-Phase Flows	3,300.00
<b>4.2 SEMINARS</b>	<b>36,000.00</b>
Advances in Mixing and Combustion	
Autumn Festival	
Best Practice for Engineering CFD	6,000.00
Dispersed Multi-Phase Flows	6,000.00
Flow Control Technologies	6,000.00
Hybrid RANS-LES Methods For Industrial	6,000.00
Microfluidics and Microheat	6,000.00
Uncertainty Quantification in Design & Simulation	6,000.00
<b>4.3 PROJECTS</b>	<b>42,000.00</b>
European Project E-CAERO	42,000.00
<b>5. FINANCIAL</b>	
Interest/ Exchange rate form Banks accounts	

Tous les montants sont en EUR.

## Budget 2010

<b>EXPENDITURE</b>	<b>-186,550.00</b>
<b>1. ADMINISTRATION</b>	<b>-82,550.00</b>
Chairman	
Coordination Center	-37,500.00
Administration Office	-37,000.00
Office Supplies	-1,550.00
Legal Publications	
Website Maintenance	-5,000.00
Eccomas membership	-1,000.00
Travel expenses	-500.00
<b>2. ETMM</b>	
<b>3. WORKSHOPS</b>	<b>-19,000.00</b>
<b>4. SUMMERSCHOOL</b>	<b>-6,000.00</b>
<b>5. SPECIAL INTEREST GROUPS</b>	<b>-6,000.00</b>
<b>6. INDUSTRIAL RELATED ACTIVITIES</b>	<b>-73,000.00</b>
<b>6.1 BEST PRACTICE GUIDE LINE</b>	
Authors Fees	
Furniture	
Credit Card Payment	
Postage & Delivery	
<b>6.2 KNOWLEDGE BASE</b>	<b>-15,000.00</b>
Knowledge Base Consulting	-15,000.00
<b>6.3 SEMINARS</b>	<b>-6,000.00</b>
Autumn Festival - DA VINCI	-6,000.00
<b>6.4 PROJECTS</b>	
European Project E-CAERO	
<b>6.5 BUSINESS PLAN</b>	<b>-7,000.00</b>
Consulting & Travel - Sarah Hutton	-3,000.00
Consulting & Travel - Chris Lea	-2,000.00
Travel - Richard Seoud	-2,000.00
<b>6.6 Payroll IEO</b>	<b>-45,000.00</b>
Salaries Richard Seoud	-45,000.00
<b>7. FINANCIAL COSTS</b>	
Financials Costs	
<b>NET INCOME (LOSS)</b>	<b>32,050.00</b>
<i>NET INCOME (Revenue 1 to 3 - Expenditure 1 to 5)</i>	<i>21,450.00</i>
<i>NET INCOME ACTIVITIES RELATED TO INDUSTRY</i>	<i>10,600.00</i>

Tous les montants sont en EUR.

2009

<b>ASSETS</b>	<b>350,155</b>
<b>1. CASH/ BANK ACCOUNTS</b>	<b>290,744</b>
Checking Account AIBS - BE	75,173
Checking Account AIBS- UK	
Checking Account ETMM	11,893
Checking Account Q&T-SIG	8,464
Cash	635
Term Account AIBS - BE	149,946
Term Account Q&T-SIG - BE	44,634
<b>2. CURRENT ASSETS</b>	<b>59,410</b>
<b>2.1. ACCOUNTS RECEIVABLE</b>	<b>55,814</b>
RESEARCH	15,750
Research 2010	
Research 2009	9,750
Research 2008	4,500
Research 2007	1,500
INDUSTRY	12,500
Industry 2010	
Industry 2009	7,500
Industry 2008	3,000
Industry 2007	2,000
ETMM	14,050
ETMM7	50
ETMM8	14,000
AUTUMN FESTIVAL	1,000
SEMINAR	700
Advances in Mixing and Combustion	170
Dispersed Multi-Phase Flows	270
Hybrid RANS-LES	
Microfluidics and Microheat	260
BEST PRACTICE GUIDE LINE	-186
Single-Phase Flows	-15
Dispersed Multi-Phase Flows	-171
<b>2.2. PROJECT RECEIVABLE</b>	<b>12,000</b>
European Project E-CAERO	12,000
<b>2.3. REVENUE RESERVE ACCOUNT</b>	<b>3,596</b>
Interest Income AIBS	2,950
Interest Income Q&T	638
Interest Income ETMM8	8

Tous les montants sont en EUR.

2009

<b>LIABILITIES &amp; CAPITAL</b>	<b>350,155</b>
<b>1. CURRENT LIABILITIES</b>	<b>39,598</b>
<b>1.1 REVENUE RESERVE ACCOUNT</b>	<b>1,054</b>
Financial Charges AIBS	450
Financial Charges Q&T	96
Financial Charges ETMM	8
Sales	500
<b>1.2. ACCOUNT PAYABLE</b>	<b>38,868</b>
Account payable	38,868
<b>1.3. ADVANCE PAYMENT RECEIVED</b>	
Advance payment received for E-ECAERO	
<b>1.4.TAXES &amp; NATIONAL INSURANCE</b>	<b>-323</b>
Social Security Administration	0
Salaries	-323
<b>2. CAPITAL</b>	<b>310,557</b>
NET RESULT ERCOFTAC	296,937
NET RESULT INDUSTRIAL RELATED ACTIVITIES	13,620



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Research member	Institution	2010	2009			
NRC-D-01	Forschungszentrum Karlsruhe INR	2010	2009			New September 2009 (250 euros)
NRC-F-01	Institut Français du Pétrole	2010				
NRC-I-01	Institute of Thermal Fluid Dynamics	2010				
R-B-05	Von Karman Institute For Fluid Dynamik	2010				
R-CY-01	University of Cyprus	2010				
R-D-02	RWTH Aachen		2009			
R-D-08	Technische Universität München	2010				
R-D-09	KfK - Kernforschungszentrum	2010				
R-D-12	Hochschule Niederrhein	2010				
R-D-19	University of Stuttgart	2010				
R-D-27	Rostock University		2009			
R-D-36	Karlsruhe Institute of Technology	2010				
R-F-02	L.E.G.I	2010				
R-F-07	Université de Potiers	2010				
R-F-15	Université de la Rochelle LEPTAB	2010	2009			
R-F-17	CEA/SACLAY DM2S/SFME/LTMF		2009			
R-F-20	Institut Jean-Le-Rond d'Alembert	2010	2009	2008	2007	
R-F-22	C.N.R.S	2010				
R-F-23	ONERA	2010				
R-GR-02	Aristotle University of Thessalonik	2010	2009			
R-GR-03	Aristotle University of Thessalonik	2010	2009	2008	2007	
R-GR-06	University of West Macedonia	2010				
R-GR-09	University of Thessalonik	2010				
R-HR-01	University of Zagreb	2010				
R-I-02	Università degli Studi di Trieste	2010				
R-I-03	Politecnico di Milano	2010				
R-I-04	Università di Roma La Sapienza		2009			They paid 2010 but they said they will not paid 2009
R-I-08	Università di Genova	2010				
R-N-01	Norwegian University of Science	2010				
R-N-03	Norwegian Defence Research	2010				
R-NL-02	TNO Science and Industry	2010				
R-P-01	Istituto Superior Tecnico	2010		2008		
R-P-03	University of Coimbra - FCTUC	2010				



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R-PL-02	University of Mining and Metallurgy	2010	2009			
R-PL-03	Czestochowa University of Technology	2010				
R-PL-04	Institute of fluid flow Machinery Polish Academy of Sciences	2010	2009	2008		
R-PL-06	Silesian Technical University		2009	2008		
R-PL-07	Kielce University of Technology	2010	2009	2008		
R-PL-09	Polish Academy of Sciences	2010				
R-S-05	LTH	2010	2009	2008		
R-S-08	Lulea University of Technology				2007	
R-UK-04	University of Southampton	2010				
R-UK-06	DAMPT University of Cambridge		2009			
R-UK-16	UMIST	2010	2009	2008		
R-UK-21	Nottingham University	2010				
R-UK-30	University of Sheffield		2009			
R-US-01	Texas A&M University	2010				
R-UA-01	Institut of Hydromechanics	2010				
		<b>40</b>	<b>17</b>	<b>8</b>	<b>3</b>	
		<b>20,000 €</b>	<b>8,250 €</b>	<b>4,000 €</b>	<b>1,500 €</b>	





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Industry member	Institution					
I-D-01	Airbus	2010				
I-D-02	Airbus	2010				
I-D-10	Volkswagen AG	2010				
I-D-14	Voith Hydro Gpower Generation	2010				
I-DK-03	Odegaard & Danneskiold-Samsoe	2010				
I-F-08	AREVA NP, Inc	2010				
I-S-02	Volvo Aero Corporation	2010	2009			
I-UK-01	Arup research & Development	2010	2009	2008	2007	
I-UK-09	W.S Atkins Engineering Sciences	2010	2009	2008	2007	
I-UK-10	BNFL Consultancy Services British Nu	2010				
I-UK-15	Qinetiq	2010	2009			
I-UK-16	Fluent Europe Ltd.	2010				
I-UK-18	BAE Systems advanced Technology	2010	2009	2008		
I-UK-20	Alstom Power	2010	2009			
I-UK-21	Renuda	2010	2009			PME
		<b>15</b>	<b>7</b>	<b>3</b>	<b>2</b>	
		<b>14,500 €</b>	<b>6,500 €</b>	<b>3,000 €</b>	<b>2,000 €</b>	
BOSCH double payment to be reimbursed						
<b>TOTAL in EUROS</b>		<b>34,500 €</b>	<b>14,750 €</b>	<b>7,000 €</b>	<b>3,500 €</b>	