



# ilass NEWSLETTER

Institute of Liquid Atomization and Spray Systems



This space is devoted to share the latest updates about the ILASS Europe Community and disseminate relevant information on Scholarships, Awards, Conferences and Workshops. **In this context I would like to invite all our community members to participate by sending Announcements you wish to spread to the **ILASS-Europe Newsletter** ([ltces@dem.ist.utl.pt](mailto:ltces@dem.ist.utl.pt)).**



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## ILASS ANNOUNCEMENTS

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### ORGANIZATION

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The last ILASS-Europe Annual General Meeting took place in Estoril, on September 6<sup>th</sup> 2011. Here are the (**please click on the item**):

[ILASS-Europe 2011 AGM minutes](#)

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### LEFEBVRE AWARD

The **Lefebvre Award** is bestowed upon a scientist who has distinguished him/ (her) self by continuing and encouraging contributions to the field of atomization and sprays. It will normally be announced at the banquet of ICLASS Conference and consists of a gift and or a certificate to be presented by the chairman of the Lefebvre Award Committee. The Award Committee, featuring representatives from each of the regional ILASS Organizations, select the recipient from amongst the nominations received. **Community members are invited to prepare nominations for this award and send them to our Chairman, Dr. Iskender Gökalp, before the end of the year.**

Please check the guidelines to prepare the nominations, **by clicking on the item here:**

[Lefebvre Award Guidelines](#)

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## ILASS-Europe EVENTS

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### ILASS 2011, Estoril-Portugal: Final Remarks

The 24th ILASS-Europe, held in Estoril, Portugal welcome a record number of participants, who shared new ideas, the latest developments and recent applications in the field of Atomization and Sprays.

The final program consisted of a mix of three plenary lectures featured by distinguished **keynote speakers** followed by three parallel sessions and poster presentations, together with an exhibition of equipment.

The **complete updated program** is available at [www.ilass2011.org](http://www.ilass2011.org) where the **abstracts and full manuscripts of all presentations can be downloaded**. Here you may also download the List of participants.

### FACTS AND NUMBERS

The 24<sup>th</sup> ILASS-Europe, Estoril, Portugal received a record number of submissions covering a large spectrum of topics on Atomization and Sprays, from the fundamentals to applications either in conventional or in emergent domains, such as those at the nano-micro scale or in biomedical engineering.

The agenda of the meeting included other classical topics such as Spray Combustion, Phase Change, Spray Cooling and Spray/Droplet Impact and **ended up with an original program with 141 oral presentations and 27 posters selected from 190 submissions, which corresponds to a rejection rate of 12%**.

Fundamentals of atomization are clearly a topic of interest, which was addressed in a very large number of submissions. The final program included **22 oral presentations**.

Modelling and computations was the topic with the largest number of submissions which ended up with **22 oral presentations**.

Engines and Fuel Sprays, one of the classical applications of sprays is also one of the topics with the largest number of presentations (**20**). This will be addressed in one of the aforementioned lectures, where numerical modelling is applied to the simulation of fuel injection sprays.

Spray diagnostics was also a strong topic, with **18 oral presentations**.

In this topic, the **conference also provided an exhibition** by some of the leader manufacturers of equipment for spray research, which was displayed during the three days of the conference.

Moreover emergent areas were particularly welcome and the 24<sup>th</sup> ILASS-Europe introduced, for the first time two sessions addressing the use of non-Newtonian sprays, and one session on applications at the nano-micro scale or to Bio Engineering. Biomedical applications will also be addressed in a third keynote lecture.

Please check the detailed last remarks at [www.iclass2011.org](http://www.iclass2011.org)

## ACKNOWLEDGEMENTS

The Organizing Committee thanks all for attending, and extends a special thanks to ILASS Europe and Instituto Superior Técnico for sponsoring. But also to other sponsors: Lechler, Caixa Geral de Depósitos, Banco Português de Investimento, Fundação para a Ciência e Tecnologia and Fundação Luso-Americana para o Desenvolvimento.

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## SPECIAL ANNOUNCEMENT

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With our deepest regret we inform that Professor Hiroyuki HIROYASU, a former president and an honorary member of ILASS-Japan, passed away the last September, 28. Professor HIROYASU made a great contribution to the establishment of ILASS-Japan. He arrived to take up the position of the vice-president when the institution was established in 1991, and then served as president from 1993 to 1994. He was a member of the executive board from 1995 to 2000. Professor HIROYASU also served as president of ILASS-International and accomplished great achievements in the field of atomization and engine combustion. We would like to express our sincere regret at the death of Professor HIROYASU and send our deepest sympathy to his family.

A special memorial service will be made in the next ILASS Asia 2011, which will be held in Taiwan.

Professor Norman Chigier expressed expressed his sincere regrets in his personal name and in the name of the whole ILASS Community in the words cited bellow:

*“PROFESSOR HIRO HIROYASU                                  IN MEMORIAM*

*I first met you in Sendai, where Professor Tanasawa presented the first Tanasawa Award and together we founded the International Institute on Liquid Atomization and Spray Systems. When I visited you in Hiroshima, you invited us to have dinner in your home. Together we attended and actively participated in all the ICLASS and many regional ILASS Conferences, over several decades. Together we nurtured many scientists, engineers and students who participated in ILASS and other Spray and Combustion Conferences, all over the world. When Min Xu, from Shanghai completed his PHD with you in Hiroshima, you wrote to me and recommended him to join my research team at Carnegie Mellon University, Pittsburgh. On the basis of the excellent foundation that you gave him in Hiroshima, he flourished as a leader of my research team for 4 years and is now famous in the Universities and Automobile Industry in China.*

*I, and so many of my colleagues from all over the world remember eating, drinking and enjoying your conversation at so many international conferences, and meetings, where we sat together at the same table.*

*Your brilliant research, your many published scientific and engineering publications as well as your as your outstanding computer codes will remain within*

*ILASS and in libraries all over the world. We will miss you, but we will remember you with your smile and the good times that we enjoyed together.*

*IN MEMORIUM TO YOU, I repeat the ancient Hebrew blessing that the High Priest blessed the people in the Temple in Jerusalem, thousands of years ago :*

*MAY THE LORD GOD BLESS YOU AND GUARD YOU*

*MAY THE LORD GOD MAKE HIS FACE TO SHINE UPON YOU AND BE GRACIOUS UNTO YOU*

*MAY THE LORD GOD TURN HIS FACE UNTO YOU AND GIVE YOU ETERNAL PEACE.*

*NORMAN CHIGIER, PERSONALLY, AND ON BEHALF OF ALL THE INTERNATIONAL ILASS COMMUNITY”*



## ATOMIZATION AND SPRAYS

Prof. Marco Marengo, the European Editor of Atomization and Sprays wishes to broaden the list of peer reviewers of this journal. As experts in the field, the members of the ILASS community are invited to collaborate. So, if you are willing to cooperate, and you have never reviewed A&S papers before, please, **complete the form in attachment to the email announcing the 23<sup>rd</sup> Issue of the ILASS-Europe Newsletter and send it to [marco.marengo@unibg.it](mailto:marco.marengo@unibg.it).**

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## FUTURE EVENTS

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The Eleventh International Conference on Combustion and Energy Utilization  
<http://www.logi-science.pt/ICCEU2012.html>

Dear Colleagues,

The next ICCEU conference will be held for the first time in the European continent, as a consequence of the global preoccupations in efficient energy utilization and renewable sources in a global world. **ICCEU 2012 will be held in Coimbra, Portugal.**

The conference warmly welcomes all combustion and energy science & technology specialists and friends to participate. A complete list of topics is outlined at the conference website which, besides the fundamentals and technologies of combustion processes, includes those within **the science of sprays**, such as fuel atomization, droplet/spray combustion or any physical process by which sprays or individual droplets determine the mixing, combustion or efficiency of energy utilization.

**The deadline for abstract submission is December 11, 2011.**

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ICLASS 2012

**September 2-6, 2012**  
**Heidelberg, Germany**



<http://www.iclass2012.org/>

ICLASS 2012 is the 12<sup>th</sup> International Conference on Liquid Atomization and Spray Systems. We would like to invite you to ICLASS 2012 where we are creating an environment that promotes international communication and collaboration, provides the highest quality technical program and inspires you in the heart of Heidelberg's Old Town.

### Important Dates

Abstract (500 words):	<b>January 6, 2012</b>
Full Manuscript (8 pages, 10MB):	<b>April 1, 2012</b>
Acceptance Notification:	<b>June 1, 2012</b>
Camera-ready manuscripts:	<b>July 15, 2012</b>
Posters:	<b>July 1, 2012</b>

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**SEVENTH 2-Day Course**



## **ATOMIZATION FOR METAL POWDERS**

**1st & 2nd March 2012**

The annual course "Atomization for Metal Powders" will be held in Manchester, 1st-2<sup>nd</sup> March 2012. Detailed information can be found at [www.perdac.com](http://www.perdac.com). Please click on the logo above to see the complete announcement.

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## **SPRAY & AEROSOL TECHNOLOGY: AN INTENSIVE OVERVIEW**

**A 2-Day Course for Industry & Researchers**

An intensive short course on "Spray and Aerosol Technology", organized by Professor Andrew Yule will be held in Manchester UK on 18th-19th April 2012. Full information can be found at <http://www.perdac.com/9.html>. Please click on the logo above to see the complete announcement.



# ILASS-EUROPE

Institute for Liquid Atomization and Spray  
Systems - Europe

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## **Minutes of the 27<sup>th</sup> Annual General Assembly (AGA) of ILASS-Europe held on September 6<sup>th</sup> in Estoril, Portugal**

The Assembly starts at 18:15 in the Atlantico Room at the Hotel Palacio Estoril with the attendance of 28 members.

### **Item 1** Opening and Approval of the Agenda.

Our Chairman, Iskender Gökalp opens the meeting thanking all the attendees for their presence. The contents of the agenda are approved.

### **Item 2** Approval of the minutes of the last AGA in Brno.

The minutes of the last AGA had already been sent to all the members by e-mail. Nobody formulates any objection and the minutes are accepted unanimously.

### **Item 3** Message from the Chairman.

Iskender Gökalp excuses the absence of our Vice-Chairman, Oskar Haidn who has been unable to attend the Conference due to his recent transfer to TU Munich. He thanks the Conference Organizing Committee for the excellent work and congratulates them on the high attendance.

### **Item 4** Election of Officers and Committee Members.

The Committee Members whose term expires this year are: Udo Fritsching, Eva Gutheil and Graham Pitcher. The three of them have already served for two terms, and according to the decision approved in our 2005 Assembly in Orleans, this is the maximum number of years of permanence in the Committee. This limitation was first applied last year and affected Günter Brenn, Christophe Dumouchel and Leif Rackwitz. The Committee proposes the candidacies of Peter Walzel, Jan Jedelsky and Lucio Araneo to the approval of the General Assembly. The proposal is accepted. The Assembly is informed that Lucio Araneo has also been asked about his willingness to assume in 2013 the position of Treasurer, in substitution of Raffaele Ragucci, whose term was exceptionally extended to resolve the details involved in his replacement. Having a new Treasurer also from Italy simplifies the process, as at present both the Association and the bank account are domiciled in this Country.

The Assembly is informed of the Committee decision to extend the two term limitation to the Web pages and Newsletter Editors.

### **Item 5** Treasurer's Report.

The report from our Treasurer, Raffaele Ragucci is presented by the Chairman, Iskender Gökalp. Differently from the provisional balance presented at the previous AGM in Brno that estimated a final amount of €20,300, the year 2010 has been closed with total assets of about €16,100 with a nominal loss of about €4,200 over the year. This is partly due to the postponement both of the cashing of the Brno Organizers payment of €6,400 (due to some technical problem solved at the beginning of 2011) and of some expenses to 2011. In addition, the payments for the PETA were of only €2,100 instead of €2,400. Taking into account these modifications, the cash flows are in line with the forecasted ones.

In the year 2011 the major expenses will be those connected to the payment of 7 Paul Esenklam Travel Award Bursaries for participants to the Estoril meeting, that will be about €3,500. The increased amount is justified by the higher number of recipients we had this time (in correspondence with a remarkable increase of the number of applicants - 22). To this outcome has to be added an amount of about €2,200.00 for auditing, taxes, bank expenses and web domain annual registration. If the contribution from the Estoril organizers is in line with the expected one, the final assets should be in the order of 20,000 euros confirming the economic stability of the Association in the past few years.

On the ground of the actual financial situation and taking into account that the contribution from the ICLASS Heidelberg organizers in 2012 will be raised to €50 per participant, the Association is surely in the position to provide the funds required for the Arthur Lefebvre award (€1,500) and to assign an amount of about €4,000 for the PETA relative to the Heidelberg meeting.

The budget is approved by the Assembly.

#### **Items 6** Situation of the Web pages and Newsletter.

As explained by the Newsletter Editor, Ana Moita, during this year the Newsletter has been accessible from the ILASS-Europe 2011 Conference Web pages. As these pages will be eventually closed, the Assembly is notified that the Newsletter will be linked to the ILASS-Europe pages, although it will also be e-mailed to the ILASS distribution list, because this is a more direct way to reach all the members.

#### **Item 7** Situation of Atomization and Sprays.

Marco Marengo, European Editor of Atomization and Sprays briefly summarizes how the situation of the journal has improved in the last year. The impact factor has increased to 0.928. The average reviewing time is now of 2.4 months and this gives an estimate for the average final online publication of 8 months. The Editor insists on the need of increasing the number of submissions to avoid a shortage of papers now that the publication time has been so significantly accelerated. It is also suggested to persuade ILASS members to consider, whenever possible, including citations to Atomization and Sprays papers in their manuscripts to help increasing the impact factor.

Last year, the percentage of rejected papers has been 20% from the Americas Editor, 30% from the Europe Editor and 80% from the Asia Editor. At present, Marco Marengo counts with a list of 248 reviewers. A form will be passed to all ILASS-Europe members asking about their availability to act as reviewers.

#### **Item 8** Report from the ICLASS 2012 Conference Chairman

Eva Gutheil, Chairman of the ICLASS 2012 Conference, shows a brief presentation of the event. The Conference will take place in the New University, in the Old Town of Heidelberg. Most details about the venue have already been completed.

#### **Item 9** Situation of the Eisenklam Travel Fund

Contrary to the case of the ILASS-Europe 2010 Meeting when only four applications were submitted, this year the number of applications for the PETA support was 22. The selection Committee presided by Bala Balachandran approved 7 awards (Florian Mathieu, Stephanie Fest-Santini, Eva Maria Littringer, Ansgar Heilig, Simona Tonini, Ahmed Elsaid Elwardany and Liran Fanny Haim) which included funding to cover for travel expenses plus the waiver of the registration fees, which at request of the selection committee was paid by the Conference Organizers as was done in Brno. The Committee considers preferable to separate as much as possible the costs that should be assumed by ILASS from those that are to be assumed by the Organizers. In accordance, ILASS will pay the registration to the Organizers (which can be effectively made by deducting this amount from the total that the Organizers have to pay ILASS after the Conference), and in this way, for organization purposes the Eisenklam students are to be treated exactly equal to the rest of the participants (which, also implies that they will contribute in 50 € to the total that has to be returned to ILASS).

As it is considered that these points should be clearly stated to avoid any possible misunderstanding, Joachim Domnick, elected new President of the PETA Selection Committee for next year, will prepare a document that will be posted in the Web pages, and that will be given to all future Conference Organizers. The Committee has decided to limit the total amount to be distributed each year, in principle, to 4000 €

**Item 10** Miscellaneous

In the 24<sup>th</sup> AGA in 2008 in Como, it was tentatively approved that the 2013 ILASS-Europe Conference would take place in Brighton. However, Prof. Morgan Heikal who presented the proposal is going to be out of the UK for the next year, so he has requested to postpone the celebration of the Conference there at least for one year. Several new candidacies have been presented, and the Committee proposes to select the following venues: Greece in 2013, organized by Manolis Gavaises, Bremen in 2014 organized by Udo Frischting, in coincidence with the final reunion of a German program on sprays and Brighton in 2015. The General Assembly endorses the Committee decision. Some further candidacies are kept in the reserve for future conferences, among them, Chalmers University in Sweden, and IFPEN in France.

Finally, the Chairman thanks the audience again for their attendance and closes the meeting at 19:00.

Zaragoza, September 2011

Dr. Antonio Lozano



# Lefebvre Award

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Professor Arthur Henry Lefebvre has been one of the most eminent and admired researchers from within our ILASS community. He was a member of both the ILASS-Americas as well as the ILASS-Europe. He became the Chairman and subsequently the first Honorary Member of the ILASS-Europe.



**Professor Arthur H. Lefebvre**

The global spray combustion community knew him very well through his pioneering research contributions in the area of spray atomization and airblast fuel injector design which served to underpin most major advances in gas turbine combustor technology including pollutant emissions since the early 1970's. His widely read and highly-regarded book 'Atomization and Sprays' gave him an unparalleled standing within the field as evidenced by his immensely large number of contributions both as an academic and as an industrial consultant. He held the titles of Professor, Head of Department and School, Emeritus Professor at both the Cranfield and Purdue Universities and the scientific community bestowed him with many prestigious, professional honours and awards.

One year after his passing away, the ILASS-Europe decided in 2004 to dedicate an award in his memory. Lefebvre Award is bestowed upon a scientist who has distinguished him/(her)self by continuing and encouraging contributions to the field of atomization and sprays. It will normally be announced at the banquet of ICLASS Conference and consists of a gift and or a certificate to be presented by the chairman of the Lefebvre Award Committee. The Award Committee, featuring representatives from each of the regional ILASS Organizations, select the recipient from amongst the nominations received.

## MOTIVATION

The Lefebvre Award is presented for distinguished, continuing and encouraging contributions to the field of atomization and sprays.

## REGULATION

1. **Committee composition.** The Lefebvre Award Committee is formed of six members. Each regional ILASS appoints two members and it will communicate their names to the ILASS Europe Committee before the ILASS Europe Meeting following the ICLASS Conference. The chairman of the Lefebvre Award Committee is chosen from the two ILASS-Europe members and he coordinates the work of the Lefebvre Award Committee.
2. **Nomination of candidates.** Each regional ILASS nominates at most two candidates. They should submit a written proposal for each of the names proposed to the Award Committee for their consideration and discussion.
3. **Selection of Lefebvre award recipient.** The members of the Award Committee evaluate all the proposals against previously defined criteria and requirements. If appropriate they can ask for further information to assist them in the evaluation process. The Award Committee identifies the recipient of the Lefebvre Award on this basis.
4. **Award.** The Lefebvre Award is announced at the banquet of the ICLASS Conference and it consists of a certificate and a gift presented by the chairman of the Award Committee or by a person appointed by him.
5. **Unexpected events.** The chairman of ILASS Europe will deal with unexpected events including the nomination of additional Award Committee members in case of resignation, death or nomination for the Award for one or more of the members of the Award Committee.

## CHANGES TO THE REGULATIONS

The Committee of ILASS Europe can modify the Lefebvre Award regulations described in this document by a majority.

# **Lefebvre Award**

## **Criteria and requirements for nomination proposals and proposal evaluation**

### ***Nomination Proposals***

A person shall be qualified as a candidate for the Arthur Lefebvre Award of the Institute of Atomization and Sprays Systems Europe if the candidate personally has made notable and valuable contributions to the arts and sciences of atomization and sprays. The regional ILASS associations are encouraged to nominate at most two deserving candidates.

The nomination proposals should include

- no more than 400 words describing the candidate's contributions to the field of atomization and sprays;
- a citation of up to 30 words of the candidate's accomplishments;
- a two-page curriculum vitae and a list of publications with up to five publications which best demonstrate why the candidate is qualified; a complete list of publications may be appended

The nomination package and more specifically the citation which is the prime source must identify significant scientific and engineering accomplishments to demonstrate the candidate's excellence as a practising scientist/engineer.

### ***Guidelines for Proposers***

Any person with a good standing in the atomization and sprays community has the right to act as Proposer however they are advised that the matter itself should be seen as confidential and active discussion and canvassing might be counter-productive.

It is the absolute responsibility of the Proposer to complete the nomination and to timely submit the complete package to their regional ILASS Lefebvre Awards Committee, ILASS Americas, ILASS Asia or ILASS Europe, represented by their presidents.

#### **ILASS Americas**

Dr. Greg Smallwood  
National Research Council Canada  
[greg.smallwood@nrc.ca](mailto:greg.smallwood@nrc.ca)

#### **ILASS Asia**

Dr. Masataka Arai  
Gunma University  
[aria@me.gunma-u.ac.jp](mailto:aria@me.gunma-u.ac.jp)

#### **ILASS Europe**

Iskender Gökalp  
CNRS Orleans  
[gokalp@cnrs-orleans.fr](mailto:gokalp@cnrs-orleans.fr)

# Lefebvre Award

## Evaluation Procedure:

The Lefebvre Award Committee formed of two members each from ILASS Americas, ILASS Asia and ILASS Europe, evaluates the proposals submitted by the regional ILASS organizations against the following criteria and requirements:

- What specific scientific or technological accomplishments of the candidate in the field of atomization and sprays merit the Lefebvre Award?
- What impacts have the candidate's atomization & sprays contributions had on the fields of engineering, science, or society?
- Where does the candidate stand in relation to the recognized leaders in the field?

## Factor

Please describe your specific knowledge of the candidate's accomplishments that support the above evaluation. Answer to the following questions will assist in the evaluation of the candidate's achievements: (Please use additional sheets if necessary.)

- Have the candidate's developments resulted in new products, processes or practises?
- Has the candidate's research resulted in inventions or innovations?
- Has the candidate demonstrated technical leadership (management or foundation of organizations)?

Please rate the candidate on a five-point scale on each of the following factors: (check appropriate rating)

	Exceptional	Very significant	Significant	
Contributions to Scientific and Technical Knowledge	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>
Contributions through Application of Technical Knowledge	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>
Anticipated sustained Contributions to the Atomization & Sprays Profession	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>

Value Judgement:

I consider the candidate to be: (check one)

exceptionally well-qualified

well-qualified

qualified

***Proposal Submittal Procedure:***

The nomination package should be sent by e-mail to the Awards Committee Chairman. He will distribute the nominations to the members of the committee and start the evaluation process in due time to allow for an appropriate planning of both the local organizer of the ICLASS meeting as well as the awards recipient.

**Nomination Deadline:** Nominations must be received at least six months prior to the ICLASS meeting date.

Lefebvre Awards Committee  
c/o Dr. Oskar J. Haidn  
Langer Grund  
74239 Lampoldshausen  
Germany

e-mail: [oskar.haidn@dlr.de](mailto:oskar.haidn@dlr.de)  
Tel. (49) 6298 28214

# ATOMIZATION FOR METAL POWDERS

## 1st & 2nd March 2012



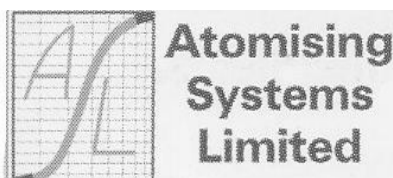
### Programme

#### Thursday 1st March

- 9.00 Registration
- 10.00 Introduction to Atomization
- 11.00 Fundamentals of Liquid Atomization
- 11.45 Historical Perspective
- 12.15 Lunch
- 13.00 Fundamentals of Melt Atomization
- 13.55 Screen Analysis and Data Interpretation
- 14.25 Gas Atomization
- 16.00 Water Atomization
- 17.30 End of Session

#### Friday 2nd March

- 9.00 Rotary, Ultrasonic & Other Techniques
- 10.30 Measurement Techniques & Modelling
- 11.30 Ancillary Equipment
- 12.30 Lunch
- 13.15 Operation & Economics of Plant
- 14.05 Needs of Different Metals
- 15.00 "Toolkit" for Atomising System Improvement
- 15.30 End of Course



### COURSE LECTURERS

John J Dunkley [Chairman, Atomising Systems Ltd, Sheffield], Dirk Aderhold [Technical Manager, Atomising Systems Ltd], Ghasem G Nasr [Director of Spray Research Group, School of Computing, Science & Engineering, University of Salford], Andrew J Yule [Emeritus Professor of Mechanical Engineering, University of Manchester]: *Authors of Atomization of Melts (AJY & JJD) Oxford University Press, and Industrial Sprays and Atomization (GGN and AJY) Springer Verlag.*

### COURSE STRUCTURE

This intensive course will be held in the Britannia Hotel Central Manchester (UK) and will include sessions covering the main methods of atomizing metals, the specific requirements for different classes of metal, the design, operation and economics of plant, measurement methods and an introduction to modelling and prediction techniques. All lunches and refreshments, printed notes and a CD containing the course material, are included. The start and finish times of the Course are 10.00 Thursday and 15.30 on Friday respectively. Registrants will have opportunities to discuss their interests with the course presenters and the presenters tailor their presentations to optimise their relevance to registrants.

### ABOUT PERDAC (<http://www.perdac.com>)

Perdac is a Campus Ventures company formed in January 2001, with the mission to organise and present high quality advanced short courses, and carry out industrial consultancy and R&D, based upon contributions from University and Industrial Scientists and Engineers who are at the highest levels in their fields.

### COURSE CONTENT

1. This course has been designed to meet the needs of industrialists, academics and researchers involved in the atomization of molten metals for powder production.
2. The technology of atomizing of metals and other melts must compete against other methods of production. The factors affecting the relative attractiveness of atomization and alternative methods will be discussed, particularly economics and quality requirements.
3. The course emphasizes both current practice and key areas of current interest in these fields, including an informative, but critical, overview of the main atomization techniques in current use.
4. The basic principles of atomization and the physical processes involved when atomizing metals are covered with clarity
5. Coverage is provided on powder and spray measurement techniques and computer modelling approaches.

### BACKGROUND OF THE COURSE

1. To satisfy requests from industry Perdac and ASL developed this course devoted entirely to Atomizing Metals for Powder Production.
2. The course has been held 6 times with updates each year, and has been attended by specialists from 15 countries and 5 continents.
3. The course provides a cohesive overview suitable for those in both the industrial and research environments. It also acts as a concise up to date introduction to those new to the field.
4. It is believed to be unique in the World in its subject matter and content



Ultrasonic Atomization of Low Melting Point Alloy and (top left) Gas Atomizer Close Coupled Nozzle

**A unique course for practitioners and researchers on the principles & practice of powder manufacture by atomization of molten metals**

## Application Slip: Atomization for Metal Powders

Please return this slip; or fax/email information; or register at [www.perdac.com](http://www.perdac.com)

Name/Title:..... Tel No: ..... Fax No.:.....  
Appointment/Occupation:..... Email:.....  
Address:.....

.....  
Name/Address for Invoice (if different from above)  
.....

Some **discounted fees** are available to bona-fide students, please enquire

The Course Fee is £890

*Accommodation: On receipt of your registration we shall provide information on recommended hotels, in different price ranges, which are near the Course Venue.:*

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**EARLY BIRD DISCOUNT £120: REGISTER BEFORE 16th JANUARY 2012 AND PAY BEFORE THE COURSE**  
**MULTIPLE BOOKINGS: £150 DISCOUNT FOR 2nd AND FURTHER PERSONS FROM ONE FIRM**

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John Dunkley and Andrew Yule published their book "Atomization of Melts" in 1994 (Oxford University Press). Since that time there have been further developments in the field, and increasing industrial and research involvement for many metals and other materials. John Dunkley was recently awarded a PhD by the University of Cambridge for his outstanding contributions to the Atomization Field. Ghasem Nasr and Andrew Yule published their book "Industrial Sprays and Atomization" in 2002 (Springer-Verlag), covering manufacturing techniques, atomizer types, and measurement techniques. They bring their experience of other fields of application of atomization to bear upon the metal atomizing field to provide useful insights. **STOP PRESS:** *Newly printed softback copies of Atomization of Melts will be available to course registrants at discounted prices*

### Contact (General):

Email [courses@perdac.co.uk](mailto:courses@perdac.co.uk)  
Fax: +44 (0) 161 278 2701

Prof A J Yule (Course Organiser)

Email: [ayule@perdac.co.uk](mailto:ayule@perdac.co.uk)

**Mail Address:** *Perdac Ltd* Technology House, Lissadel Street, University of Salford, Manchester M6 6AP, UK

**Websites:** [www.perdac.com](http://www.perdac.com)  
[www.atomising.co.uk](http://www.atomising.co.uk)  
[www.cse.salford.ac.uk/SRG](http://www.cse.salford.ac.uk/SRG)  
[www.andrewyule.co.uk](http://www.andrewyule.co.uk)

### THE VENUE

All lectures and lunches will be held in the Britannia Hotel in central Manchester. Detailed Joining Instructions will be provided. Manchester Airport has direct services to most European countries and many long haul flights throughout the World. The airport is directly linked by train to central Manchester (15min journey).

*The organisers & lecturers reserve the right to modify details of courses if required. Courses run conditional on meeting minimum delegate numbers by a deadline date; see Policy & Conditions at <http://perdac.com/2.html>*





# SPRAY & AEROSOL TECHNOLOGY: AN INTENSIVE OVERVIEW

## A 2-Day Course for Industry & Researchers

**DATES: 18<sup>th</sup>–19<sup>th</sup> April 2012**

### BACKGROUND

Since 1982 Professor Andrew Yule has organized more than 20 Short Courses on atomization and sprays, with around 500 registrants from industry, universities and research organisations. This new course ran for the first time in 2010 and it addresses the need for a thorough introduction to the subject and an overview of the important aspects such as atomizer design, measurement, and modelling. ***It is an intensive 2-day course that focuses exclusively on material that is of direct use to those entering the field of design, development or use of aerosol or spray systems, or to researchers who are relatively new to the subject area.***

### COURSE STRUCTURE

The course will be held at the University of Salford, in Central Manchester, UK. ***It contains extensively illustrated lectures interspersed with videos. Demonstrations of instruments, sprays and computational fluid dynamics (CFD) are provided.***

**For full information and to register on the course please visit**

[www.perdac.com](http://www.perdac.com)



### COURSE CONTRIBUTORS

**Professor Andrew Yule** (Emeritus Univ Manchester), **Professor Ghasem Nasr** (Univ of Salford),

**Dr Martin Burby** (Univ Salford)

**Dr Martin Hyde** (TSI Ltd)

**Dr Arvind Jasuja** (Cranfield Univ)

They have been involved for many years in the design, application, performance characterisation and prediction of atomization and two phase flow systems and they have worked closely with many major companies.

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