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**IOP** | Institute of Physics  
**Physical Acoustics Group**

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NEWSLETTER

October 2008

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See <http://pa.iop.org> for further details

## Note from the chair

2008 has been a very successful one for the Group with an excellent conference (AFPAC08) held in January and a similarly stimulating Tutorial Day held in September in conjunction with our AGM. Some new faces joined the committee at the AGM and some longstanding supporters stepped down. Also at the AGM, we awarded the Bob Chivers Prize. These and future planned activities are described below.

Andrew Temple,  
Chair,  
15 October 2008

## Anglo French Physical Acoustics Conference 2008 (AFPAC08)

As usual our annual conference was held in conjunction with GAPSUS of the Société Française d'Acoustique. This year it was held at The Holiday Inn, Ashford, Kent from the 16<sup>th</sup> to the 18<sup>th</sup> January. The invited speakers: Bajram Zeqiri, National Physical Laboratory; Serge Mensah, LMA, CNRS, Marseille; Glen McHale, Nottingham Trent University; Joseph Moysan, Université de la Méditerranée; Paul White, University of Southampton; Guy Feuillard, Ecole nationale d'ingénieurs du val de Loire, LUSI, Blois; gave exciting talks ranging from determining the absolute properties of fluids, through computed tomography, acoustic wave sensors and using structural noise of propagation through heterogeneous materials to characterise these materials, to growth of bubbles in an acoustic field, and finally to functional characterisation of piezoelectric materials.

Some 40 other talks were presented by delegates from the United Kingdom, France, and Belgium. These covered a wide variety of topics in physical acoustics from wave generation and propagation, through imaging, non-destructive evaluation, bubbles and sonochemistry, to sensors, sperm quality and trabecular bone strength; to mention only a few.

### Tutorial Day

This was held, as usual, at IOP Headquarters in London and was associated with our Annual General Meeting (AGM). The AGM is always free to members to attend but we charge a nominal fee to cover refreshments and the cost of the room for the tutorial. This year we had a theme of non-linearity. We welcomed three distinguished speakers: Professor Victor Humphrey from University of Southampton; Professor Andrea Prosperetti, John Hopkins University, USA; and Dr Sigrun Hirsekorn, Fraunhofer Institute for Non-Destructive Testing, Germany.

Victor Humphrey set the scene by giving a clear and informative tutorial on the basic physics of non-linear propagation, using finite amplitude waves. The non-linearity parameter  $B/A$  was introduced and its variation in tissue discussed along with the consequences for medical ultrasound.

Andrea Prosperetti started by showing many pictorial works of art from old masters showing how bubble symbolism had been used. After this fascinating introduction he guided us systematically through the basic aspects of dynamic bubble behaviour as the external acoustic field fluctuates. We were given an understanding of: harmonic and subharmonic generation together with other

aspects of bubble behaviour such as sound scattering, bubble-bubble interactions, the effects of temperature and a non-negligible vapour pressure.

Sigrun Hirsekorn finished the tutorial day with a vast compendium of cases of non-linearity studied in a large European 6<sup>th</sup> Framework Programme. We learnt that almost without exception, non-linearity can be found in quasi-static and dynamic experiments done on rocks, soil, cement, concrete, composite materials, and materials with imperfections of almost any sort.

## Annual General Meeting

We were sorry to see David Cartwright step down as chair of the group after many years of dedicated leadership. We, as a group, have developed AFPAC and the Tutorial Day under David's chairing. We thank David for all his hard work over many years and hope to be able to continue to consult him on future AFPAC conferences. Professor Glen McHale also stepped down from the committee. We shall miss Glen's political skill and advice. Dr Nader Saffari remains as hon. secretary and I have become chair whilst Dr Eleanor Stride is the new group hon. treasurer. In addition we welcome Dr Theodosia Stratoudaki to the committee.

## Bob Chivers Prize

Every two years: 2008, 2010, 2012, etc., the Group awards the Bob Chivers prize for the best paper published as a results of their studies by a PhD student at a UK university. The paper has to be principally the work of the student in connection with their PhD studies. The paper must have been accepted for publication, but not necessarily published, by the cut-off date in the two year cycle.

This year's winner was Dr Marco Morbidini of Imperial College, with a paper on "Prediction of the thermosonic signal from fatigue cracks in metals using vibration damping measurements". The prize is £300 and a certificate. It is not too soon to be thinking of entry nominations for the 2010 prize award. Contact Nader Saffari for more details.

## Future Events

### ***AFPAC09***

To avoid a conflict with other physical acoustics conferences, our AFPAC09 will be held in December 2008 – this year – rather than in January 2009. It will be held between 8-10<sup>th</sup> December at Arcachon, France. The deadline for submission of abstracts is 14<sup>th</sup> November, 2008. See the IOP website for full details.

### ***Tutorial Day***

Our Tutorial day for 2009 will have an imaging theme and the provisional date is the 17<sup>th</sup> September 2009.

### ***AFPAC10***

We are already planning this event for mid- to late January 2010 with the intention of holding an enhanced meeting in conjunction with GAPSUS and also Group de Recherche with a venue in the Lake District. Watch out for advance publicity of this event.

## Group committee

*Chair:*

**Dr Andrew Temple CPhys FInstP**

*Secretary:*

**Dr Nader Saffari CPhys MInstP**

University College London

*Treasurer:*

**Dr Eleanor Stride AMInstP**

University College London

*Ordinary Members:*

**Dr Christopher Edwards MInstP**

**Mr Pierre Gelat MInstP**

National Physical Laboratory

**Professor Victor Humphrey CPhys MInstP**

University of Southampton

**Professor Michael Lowe MInstP**

Imperial College London

**Professor Glen McHale CPhys FInstP**

Nottingham Trent University

**Dr Simon Richards CSci CPhys FInstP**

QinetiQ Winfrith

**Dr Robert Round CSci CPhys MInstP**

Staffordshire University

**Dr Theodosia Stratoudaki AMInstP**


University of Nottingham

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