

CPG Newsletter

CURRENT RESEARCH IN COMBUSTION

A FORUM FOR RESEARCH STUDENTS & EARLY CAREER RESEARCHERS

Researchers wishing to submit a poster or present their current combustion-related research should submit an abstract to Dr. Ramanarayanan Balachandran (r.balachandran@ucl.ac.uk) by 31st July 2019, indicating your preference for a poster or oral presentation. Presentations should be 20 mins long & 5 mins for questions. Presenters should either be research students or researchers at early stages of their research career having obtained their research degree in the last 5 years.

FUNDING OPPORTUNITIES

EARLY CAREER RESEARCHERS FUND

Providing financial support to early career researchers to attend international meetings and visit international facilities. Bursaries up to the value of £300 are available. For further information, see www.iop.org/about/grants or contact supportandgrants@iop.org.

RESEARCH STUDENT CONFERENCE FUND

Providing financial support to research student members to attend international conferences and major national meetings. For further information see www.iop.org or contact supportandgrants@iop.org.

GROUP PRIZES

RICARDO AWARD FOR BEST UK PAPER

For significant technological advance or significance of the contribution in advancing understanding at a fundamental level.

LEFEBVRE PRIZE FOR BEST UK PHD THESIS IN THE FIELD OF COMBUSTION PHYSICS

This award will be judged on the significance of the contribution, and difficulties overcome.

FELIX WEINBERG PRIZE

For best paper presented at the “Early-Career Researchers” meeting, organised by the IOP Combustion Physics Group and held every two years.

PAST EVENTS

CPG MEETING ON COMBUSTION AND SAFETY



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Current Research in Combustion:

A forum for Research Students & Early Researchers

One-day meeting at:

Sir Robert Hadfield Building

Dept. of Chemical & Biological Eng.

University of Sheffield

Sheffield S1 3JD

19 September 2019

Invited lecture by Professor Jim Swithenbank
*“2019 Recipient of Huw Edwards’ award for
Outstanding Contribution to Combustion Physics”*

Provisional programme

- 09:00 Registration and Coffee
- 10:00 Introduction by Chairman of the Institute of Physics - Combustion Physics Group: Prof. Yannis Hardalupas Imperial College London
- 10:15 Morning Technical Session
- 12:15 Lunch and Posters
- 13:30 Afternoon Technical Session
- 15:00 2019 'Huw Edwards Award' Lecture by Professor Jim Swithenbank
- 15:45 Tea and Posters
- 16:15 Presentation of Prizes and Close
- 18:30 Dinner to honour Professor Jim Swithenbank (details to be confirmed)

THE MEETING

The aim of the meeting is to provide a forum for contributions on current research in topics relevant to combustion physics and an opportunity to meet other researchers and industrialists. The meeting is **sponsored** by the **IOP** and **industry** and will provide industrialists with a broad view of current combustion research and a chance to meet potential recruits in the field.

The meeting includes **oral and poster presentations** from early careers researchers from leading research groups in the field of Combustion Physics and covers many varied aspects of combustion. The meeting is open to members and non-members of the Institute of Physics and promises to be an interesting and constructive day of presentations and discussions about current research topics in Combustion Physics.

Researchers wishing to submit a poster or present their current combustion-related research should **submit an abstract** to Dr. Ramanarayanan Balachandran (r.balachandran@ucl.ac.uk) for consideration as soon as possible, **latest 31st July 2019**. Please indicate your preference for a poster or oral presentation. The presentations should be 20 minutes in length leaving 5 minutes for questions. Presenters should either be research students or researchers at the early stages of their research career (having obtained their research degree in the last 5 years).

Three Prizes will be awarded during the day:

The **best presentation** of the day will receive the Felix Weinberg award;

The **best poster** will receive an award from the Combustion Physics Group of the Institute of Physics;

The **best industrially-relevant contribution** will receive a prize of £250 from British Flame.

Companies wishing to **display a stand** for recruitment purposes should contact Prof. Yannis Hardalupas (y.hardalupas@imperial.ac.uk) for further information.



Early Career Researchers Fund

FINANCIAL SUPPORT TO EARLY CAREER RESEARCHERS

Providing financial support to early career researchers to attend international meetings and visit international facilities.

Bursaries up to the value of £300 are available. Applications are considered on a quarterly basis and should reach IOP by 1 March, 1 June, 1 September and 1 December.

Note that grants will normally cover only part of the expenses incurred in attending a conference or visiting a facility, and are intended to supplement grants from other sources.

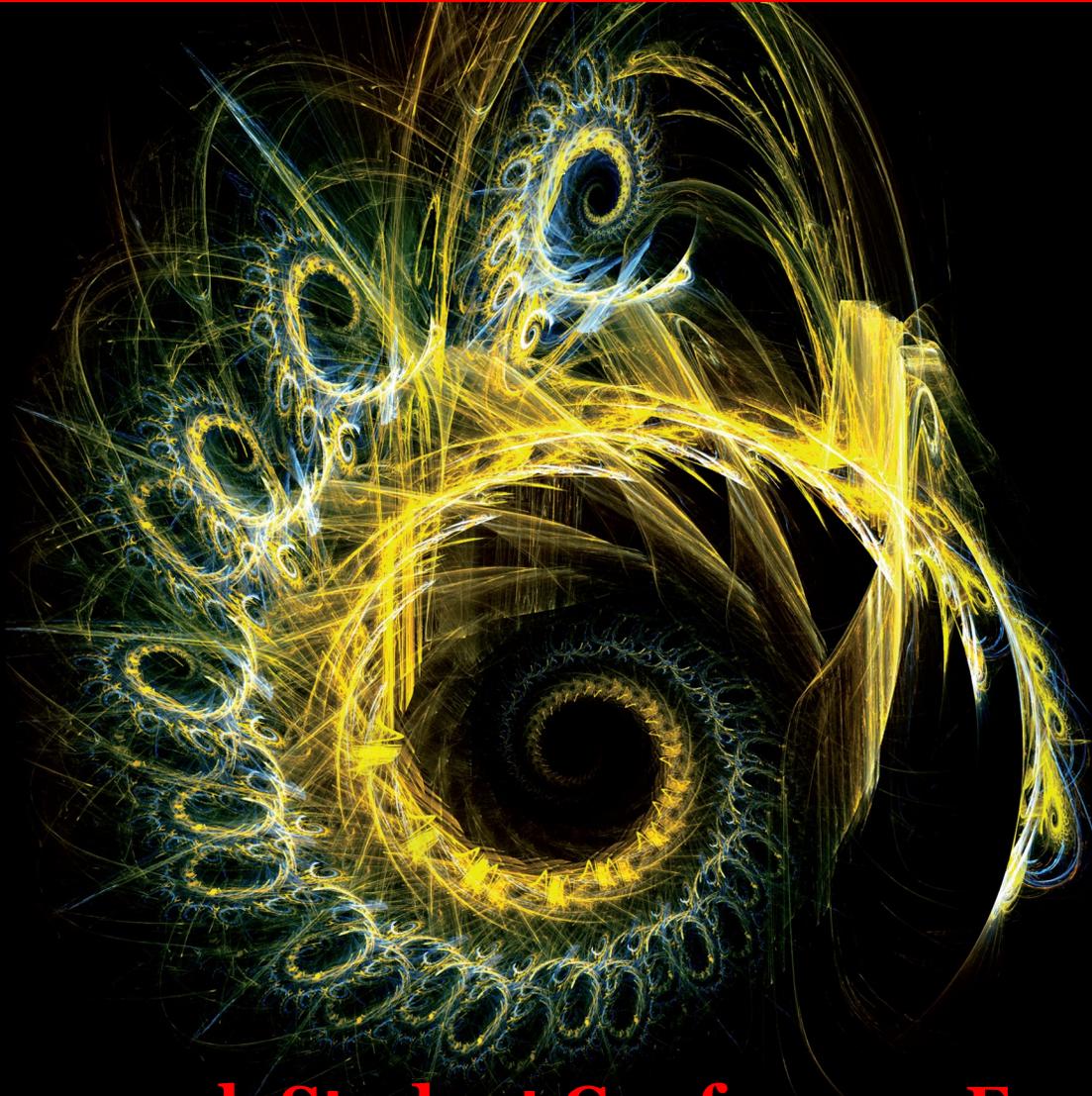
Please complete and return the application form. For further information, see iop.org/about/grants or contact supportandgrants@iop.org.

ELIGIBILITY CRITERIA

Early career researchers must meet the following eligibility criteria:

- Be within three years of beginning their first paid contract of employment in industry or academia, either full-time or part-time, where research and/or the application of physics is the primary function of their role (excluding career breaks)
- Be a member of IOP and at least one of its special interest groups
- Researchers in industry must secure funding from their employer or a third party to match the value of the bursary.

Funding Opportunity from IOP



Research Student Conference Fund

Providing financial support to research student members to attend international conferences and major national meetings.

For further information see www.iop.org or contact supportandgrants@iop.org

RESEARCH STUDENT CONFERENCE FUNDS WINNERS

“The 37th Symposium on Combustion took place from the 29th of July to the 3rd of August in Dublin, Ireland. It consisted of a social program—including several dinners and receptions—and an extensive core program with at least one daily plenary lecture. This year was the first to have an extensive and independent section on fire research. A specific focus was smouldering combustion, which is one of topics of my PhD. Each day was structured in the same way: It started with a plenary lectured followed by 10 parallel sessions. In the beaks between the talks, one had the chance to discuss the work in progress of other researchers during the poster sessions.”



“[...] the overview of turbulent combustion by Simone Hochgreb and reaction kinetics by Henry Curran [...] not only gave an overview of the state-of-the-art research, but also an idea of where each field is moving”.

EXPANDING MY EXPERIENCES AND CAREER HORIZONS

My talk was the last on Thursday, which gave me the chance to attend other talks for 3 days. These days were interesting for two reasons. Firstly, they gave me an insight into the wide variety of research topics within combustion. Secondly, they gave me the chance to meet PhD students from all around the world and invite them to my own talk. As my topic is quite niche, I only had limited discussions prior to my talk, but very interesting discussions afterwards. Especially the questions and comments during my talk, helped me to better understand the problem.

These information will be useful to improve my future research.

The official social program consisted of two receptions (welcome and farewell), one young researchers mix, and the banquet. Each of them resulted in interest conversation and fruitful discussion.

My free evenings, I used to explore the city of dublin and its history. Surprisingly, Ireland has only been an independent state for just over 100 years, but has a long historic of battling for its independence from London.

Overall, I found the Symposium on Combustion extremely useful. It gave me the opportunity to meet the leaders of my field, potential collaborators, as well as several PhD students from other areas of combustion. Hopefully, these contacts will remain in the coming years. At the same time, the invited talks gave an overview of the current state-of-art of combustion, which broadens my overall view on combustion. Last, but not least, Dublin was the good location for a conference providing the good balance between work and pleasure.

RESEARCH STUDENT CONFERENCE FUNDS WINNERS

Winner Profile

Yu Xia

IOP member no. 1174713

Mechanical Engineering, Imperial College London, London SW7 2AZ, UK

yu.xia13@imperial.ac.uk

12th International ERCOFTAC Symposium on Engineering Turbulence Modelling and Measurements (ETMM12)

"ETMM12 conference took place at Montpellier, France, from 26th-28th September, 2018. It was organised by the European turbulence and combustion communities and chaired by Prof. Franck Nicoud from University of Montpellier. A record-breaking number of 220 participants had attended the conference from over 25 countries and 4 continents. A series of guest speakers including Prof. Peter Schmid from Imperial College, Prof. Philippe Spalart from the Boeing company, Prof. C. O. Paschereit from TU Berlin and others shared their recent progress on turbulence modelling and simulation, thermoacoustic instability, and combustion RANS/LES/DNS, etc., all of which attracted a large audience and inspired young researchers like myself".

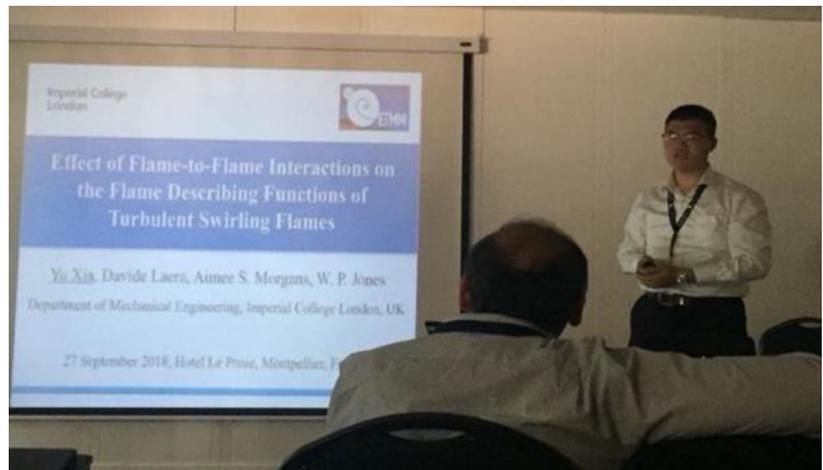
"By attending this conference, I have had the precious chance to present my PhD work on the flame-to-flame interactions, which received a good feedback from the session chair and the audience".

WHAT I GAINED FROM THE CONFERENCE

I attended many technical sessions over many topics, such as LES, turbulence modelling and combustion, etc., which largely broadened my knowledge and kept me updated on the latest achievements in these fields. Through discussions after the talks, I expanded my academic network and saw the potential for future collaborations with many researchers from other institutions. Last but not the least, the social events are also well organised. We had the chance to

explore the city centre of Montpellier and had a wonderful dinner in a classical French restaurant. Based on all of these, I strongly believe this conference is a great success.

I wish I could attend the next conference ETMM13 in Greece in 2020. Finally, please find below the photo taken during my conference presentation.



COMBUSTION PHYSICS GROUP PRIZES

RICARDO AWARD FOR BEST UK PAPER

Deadline for nominations: 30 June 2019

The award shall be made for significant technological advance or significance of the contribution in advancing understanding at a fundamental level, intended to be awarded every two years. The prize is £250 and shall be accompanied by a certificate.

Eligibility

Any peer-reviewed paper authored by researchers from UK or Irish institutions or organisations, published in an archive journal or at the Combustion Institute Symposium in the previous two calendar years, in any field of combustion physics: diagnostics, measurements, computation, modelling, theories, etc.

Nominations process

A call for nominations will be issued every two years. The call will go out to group members, be published on the IOP website and distributed to associated organisations such as the Combustion Institute (BS), British Flame, etc.

Selection process

The selection will be by a sub-committee of the Combustion Physics Group committee. A candidate may not serve on the prize committee when his/her candidacy is considered. The winner will be announced at a Combustion Physics Group meeting.



Sir Harry Ralph Ricardo

26 January 1885 - 18 May 1974

One of the foremost engine designers and researchers in the early years of the development of the internal combustion engine. Among his many other works, he improved the engines that were used in the first tanks, oversaw the research into the physics of internal combustion that led to the use of octane ratings, was instrumental in development of the sleeve valve engine design, and invented the Diesel "Comet" Swirl chamber that made high-speed diesel engines economically feasible.

COMBUSTION PHYSICS GROUP PRIZES



Prof. Arthur H. Lefevre

14 March 1923 – 24 November 2003

British scientist and an innovative leader in the science and engineering of fuel sprays and combustion in gas turbines.

1984: ASME Gas Turbine Award, ASME R. Tom Sawyer Award

1995: IGTI Scholar Award

2002: ASME George Westinghouse Gold Medal

- Co-authored over 160 archival publications, 13 patents and 3 books

LEFEBVRE PRIZE FOR BEST UK PHD THESIS

Deadline for nominations: 30 September 2020

This award will be judged on the significance of the contribution and difficulties overcome, intended to be awarded every two years. The prize is £250 and shall be accompanied by a certificate.

Eligibility

Any PhD thesis published or examined by a UK or Irish University from 1 January 2018 to 31 December 2019 is eligible for the award. The PhD can be in any field of combustion physics: diagnostics, measurements, computation, etc.

Nominations process

Supervisors of the PhD theses make the nominations and should send the thesis abstracts and a supporting letter (200 words max.) to: Konstantina Vogiatzaki K.Vogiatzaki@brighton.ac.uk, quoting "Lefebvre Award Nomination" in the subject field. Electronic copies of only the shortlisted theses would be requested by the prize committee for assessment at the final stage.

Selection process

The selection will be by a sub-committee of the Combustion Physics Group committee. The winner will be announced at a Combustion Physics Group meeting.

COMBUSTION PHYSICS GROUP PRIZES

FELIX WEINBERG PRIZE FOR BEST PAPER PRESENTED AT EARLY CAREER RESEARCHERS

Nominations Open

Felix Weinberg prize for best paper presented at the “Young Researchers” meeting, organised by the IOP Combustion Physics Group committee and held every two years.

Eligibility

All those presenting papers at the meeting are considered for the award. Presenters should either be research students or researchers in the early stages of their research career (having obtained their research degree in the last 5 years, allowing for career breaks).

Selection process

Acceptance of papers for presentation is by the sub-committee organising the meeting. Consideration will be given to ensuring a balance of topics, between experimental and modelling, and between industrial and academic submissions.

The candidates are judged by a panel of at least three people, selected from the Combustion community either by the committee group chair or the committee member responsible for prizes.

As the prize is awarded for the best presentation, judging is based on an assessment of both the subject matter and the delivery of the presentation.



Prof. Felix Weinberg

2 April 1928 – 5 December 2012

Emeritus Professor of Combustion Physics, Felix Weinberg, started work in Imperial in 1951, and often refers to the College as: "The centre of the known universe in terms of research".

1961: D.Sc. by the University of London

1967: Appointed to a Personal Chair as Professor of Combustion Physics

1972 & 1980: Silver & Gold Bernard Lewis Medals

2005: The Hugh Edwards Lifetime Achievement Award for contributions to Combustion Physics has been conferred on him by the IOP.

THE EVENT DETAILS

Combustion Institute members & IOP members - £17

Non-members - £42

For additional information contact:

Prof. Y. Hardalupas
y.hardalupas@imperial.ac.uk

Kindly sponsored by:



PAST EVENT

COMBUSTION AND SAFETY

The meeting was held at the new HQ of IOP and was successfully organised by the Combustion Physics Group which attracted approximately 50 participants. The meeting discussed aspects of Combustion that affect safety in different sectors.

AT A GLANCE

Talks included people from the academia and the industry:

- ◆ Prof. Yannis Hardalupas, CPG Chairman
- ◆ Dr. Stuart Hawksworth, HSE, Buxton, Head of Centre for Energy and Major Hazards
- ◆ Dr. Stephen Welch, BRE Centre for Fire Safety Engineering, University of Edinburgh
- ◆ Prof. Vladimir Molkov, University of Ulster
- ◆ Dr. Andrzej Pekalski, Shell Global Solutions
- ◆ Prof. Phil Bowen, University of Cardiff
- ◆ Dr. Nicolas Tonello, ConstelCom Ltd

COMBUSTION PHYSICS GROUP

The Combustion Physics Group provides a forum for the discussion of the physical aspects of flames, ignition, detonation and related topics.

It is concerned with these issues both at a fundamental level and in the context of the practical use of wanted combustion processes in engines, boilers and other systems and unwanted combustion in the form of fires and explosions. Emphasis on the physical aspects of combustion is continuing to increase rapidly. The Group was formed in 1973 and current membership comprises a good mix of industrialists and academics.

The Group arranges several meetings a year, some independently, others in association with other Groups of the Institute and some jointly with other professional bodies such as the British Section of the Combustion Institute and the Institute of Energy. A newsletter containing relevant articles, reports on meetings and a diary of future events is produced twice a year.

Institute of Physics

Should you wish to get in touch with a member of the group committee, please contact the Groups & Awards

Officer: groups@iop.org

Editor-in-chief: Ilias Konstantinou
i.konstantinou@newcastle.ac.uk

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IOP Institute of Physics

COMBUSTION PHYSICS EVERYWHERE

The combination of electrical discharges and plasma jets with flames, together with spark ignition, are among the growing field of electrical aspects of combustion. Hybrid electrical/combustion devices are likely to become more important as the cost of fuel increases. The physical properties of low temperature plasmas generally have also been embraced within the interest of the Group at the request of a number of leading workers in the field. Concern about combustion noise and particulate emissions has led to association of the subject with acoustics and with the scattering of energy respectively. The rapid fluctuations in energy price-

es, together with increasing concern over the environmental impact of combustion processes, have led to an appreciation of the relevance of combustion and heat transfer to the development of high efficiency appliances with reduced environmental impact and to the use of poor fuels and lean mixtures for heat generation. The need for economy has also engendered renewed interest in topics such as sensing, feedback and control in combustion systems at the applied level and in modelling combustion processes at a fundamental level both in laboratory systems and in practical devices using combustion for heat generation.

Chair: Prof Yannis Hardalupas FInstP
Treasurer: Mr Jonathan May MInstP
Secretary: Ms Catherine Goy CPhys FInstP
Ordinary Members:

Dr Steven Box CPhys MInstP
Dr Iain Burns MInstP
Mr Peter Gill MInstP
Dr Richard Marsh MInstP
Dr Nedunchezian Swaminathan MInstP
Dr Konstantina Vogiatzaki MInstP
Dr Ramanarayanan Balachandran MInstP
Mr Ilias Konstantinou MInstP

Co-opted Members:

Dr Kenneth Young
Dr Graham Pitcher MInstP