2016 Medalists and Award Winners

Gold Medals Silver Combustion Medal Hiroshi Tsuji Early Career Researcher Award Bernard Lewis Fellowships Awards Committees



Congratulations to the Winners

It is most rewarding to honor outstanding scientists for their contributions. With my great pleasure, I acknowledge the proposers and committees who have contributed to identify and honor those receiving awards today. Most of all I wish to enthusiastically congratulate the recipients of the Gold and Silver Medals, of the inaugural Hiroshi Tsuji Early Career Researcher Award, and of the Bernard Lewis Fellowships. May I also mention that you will witness the first bestowal of the new Gold Medal, introduced upon decision of the Board of Directors and named in reminiscence of Jürgen Warnatz.

We are a growing society, and many have contributed to combustion science and applications with their work. Much of this work has been seminal, but there are great scientists of all career stages who are not called to the podium today. Thus please join me in celebrating all winners and in addition, in thanking all dedicated, excellent researchers whose work shapes our field.

Katharina Kohse-Höinghaus President, The Combustion Institute



The Combustion Institute

5001 Baum Boulevard, Suite 644 Pittsburgh, PA, USA 15213-1851 Ph: 1.412.687.1366 Fax: 1.412.687.0340 Office@CombustionInstitute.org CombustionInstitute.org

The Combustion Institute

Bernard Lewis Gold Medal

Awarded to Robert J. Kee

For brilliant research in the field of combustion, particularly on pioneering development of chemically reacting flow simulations and the CHEMKIN family of models.

Medalist's Biography

Robert J. Kee holds the position of George R. Brown Distinguished Professor of Engineering at the Colorado School of Mines (CSM), United States. He joined the CSM faculty in 1996, following a distinguished career at Sandia National Laboratories, United States.

Prof. Kee has made important scientific contributions to computational modeling of chemically reacting flows in diverse fields, such as flame structure, surface chemistry and heterogeneous catalysis, thin-film chemical vapor deposition, and electrochemistry for fuel cells and batteries. His contributions have significantly advanced theoretical and computational capabilities to model the coupled interactions of complex chemistry and electrochemistry with mass and energy transport.

Prof. Kee is the principal architect and developer of the CHEMKIN family of software, which for over 25 years has been applied extensively to model chemically reactive systems. He was awarded the Silver Combustion Medal of The Combustion Institute in 1990 for his contributions explaining the structure and extinction of



opposed-flow premixed flames. In 1991, he received the Bastress Award for Outstanding Contributions to Technology Transfer from Sandia National Laboratories. The Colorado School of Mines has recognized his accomplishments with several awards, including the Excellence in Research Award in 2016.

In addition to publishing some 200 archival papers, Prof. Kee is the lead author of an advanced textbook (Kee, Coltrin, and Glarborg, Chemically Reacting Flow, Wiley, 2003). His seminal paper on chemical vapor deposition in 1984 is among the 25 most-cited papers in the history of the Journal of the Electrochemical Society.

In 1992, he received the DOE Basic Energy Sciences Award for Sustained Outstanding Research in Materials Chemistry. Prof. Kee's recent research is focused on modeling electrochemistry, with a wide range of applications that include fuel cells, Li-ion and Na-based batteries, ceramic ionic-electronic conducting membranes, fuel synthesis and processing, and microreactor technology.

Alfred C. Egerton Gold Medal

Awarded to Philippe Dagaut

For outstanding experimental and kinetic modeling contributions to combustion chemistry, especially in the use of the jetstirred reactor to study fuels for practical engine applications.

Medalist's Biography

Prof. Philippe Dagaut is Research Director, Prof. Dagaut is an active member and former Group Leader at CNRS-INSIS, ICARE (Centre National de la Recherche Scientifique) at Orléans, France, since 2003, and guest Professor at Chemical Society and the ASME. He has been an the University of Science and Technology, China. He began his career with CNRS in 1988, focusing on experimental and detailed modeling studies of the chemical kinetics of combustion.

cal Chemistry from the University Pierre and Marie Curie, France. In 2000, he earned his accreditation to supervise research from the University of Orléans. He has supervised 22 master's degree and 32 Ph.D. students, as well as 22 postdoctoral scholars.

Prof. Dagaut is a recipient of the prestig- istry, Prof. Dagaut has produced a wealth of ious Paul Laffitte Thesis Prize from the French Section of The Combustion Institute. He has also received a European Research Council Advanced Grant (2011-2016) and the CNRS Silver Medal in 2016.



chair of the French Section of The Combustion Institute. He is also a member of the American organizer of many conferences, including his service as program committee co-chair for the 33rd International Symposium on Combustion in Beijing, China.

In 1986, Prof. Dagaut earned his Ph.D. in Physi- Prof. Dagaut has served as editor for several technical journals, including the principal journals of The Combustion Institute. He has also served on the CI Board of Directors, and as a member and co-chair of multiple committees.

> A pioneer in the development of the jet-stirred reactor as a research tool for combustion chemexperimental measurements to provide a valuable resource for combustion chemistry kinetic modeling.

About the Bernard Lewis Gold Medal

The gold medal is named after Bernard Lewis (1899-1993), a founding member of The Combustion Institute. As a physical chemist in the Chief Explosives and Physical Sciences Division of the U.S. Bureau of Mines in Pittsburgh, combustion research. Pennsylvania, Lewis was a pioneer in theoretical and experimental combustion research. In

this position Lewis directed research in combustion, flames, explosions, and explosives. Lewis' lifetime of work and his passion to help young scientists shaped the modern field of

About the Alfred C. Egerton Gold Medal

and Technology, Egerton was an acknowl- bustion scientists around the world. edged leader in Britain among scientists engaged in research in the field of combustion,

The gold medal is named after Sir Alfred C. explosions, and flame. In his later career, Eger-Egerton (1886-1959), the first chairman of the ton devised with his students, a flat-flame British Section of The Combustion Institute. As burner configuration that advanced flame a professor at the Imperial College of Science measurements under ideal conditions for com-

Ya B. Zeldovich Gold Medal

Awarded to Thierry Poinsot

For outstanding contributions to the theory of turbulent combustion and combustion dynamics, particularly for influential developments of DNS and LES and their combustion applications.

Medalist's Biography

Prof. Thierry Poinsot is a Research Director of the Institut de Mécanique des Fluides de Toulouse (CNRS and Institut National Polytechnique de Toulouse), France. He is also the leader of the CFD team at CERFACS (Center for Research and Formation for Advanced Scientific Computation). France, A worldwide consultant in great demand, he also spends most summers at the Center for Turbulence Research at Stanford University, United States.

Prof. Poinsot completed his Ph.D. in 1983 and Thèse d'État in 1987 under the supervision of Prof. Sébastien Candel, at the École Centrale Paris, France. He was a postdoc at Stanford University for two years before moving to Toulouse.

Since 1992, Prof. Poinsot has been a leading researcher in computational turbulent fluid mechanics applied to reacting flows. In particular, he has led the advances in turbulence simulations for combustion through LES and DNS, publishing highly acclaimed and cited papers. His work has significant impacts on aeronautical



propulsion, automotive engines, and gas turbines.

Prof. Poinsot is the co-author of the leading book, Theoretical and Numerical Combustion. He is also an Associate Editor of Combustion and Flame. He served as program committee cochair of the 35th International Symposium on Combustion in San Francisco, CA, United States. He delivered a plenary lecture at the 26th Symposium in Naples, Italy. This year, he presents the Hottel lecture.

In 1993, Prof. Poinsot was the first recipient of the Cray Prize for Scientific Computing. He was awarded the Edmond Brun Prize of the Académie des Sciences in 1996 for Fluid Mechanics, and the Grand Prix de l'Académie des Sciences, Paris in 2003. Since 2009, he has been recognized with the Prime d'excellence scientifique of CNRS. In 2012, he received an advanced grant from the ERC (European Research Council), to work on combustion instabilities.

Inaugural Jürgen Warnatz Gold Medal

Awarded to Henning Bockhorn

For exceptional scientific contributions having a major impact on combustion applications, including the fundamental understanding of soot evolution and combustion noise.

Medalist's Biography

Prof. Emeritus of Chemical Engineering and Combustion Technology, Henning Bockhorn has been head of the Institute of Chemical Engineering and the Division of Combustion Technology of the Engler-Bunte-Institut at the Karlsruhe Institute of Technology (KIT), Germany. Since 1998, he has served as Director of the DVGW Research Institute of Technology at KIT.

Prof. Bockhorn completed his Ph.D. and Habilitation at the Technical University of Darmstadt, Germany. His professional research career has focused on the fundamentals of combustion systems, ranging from mixing and chemical reactions in laminar and turbulent flows, ignition and flame propagation, formation of pollutant and toxic chemicals during combustion, combustion characteristics of biomass combustion, and development of novel diagnostics for combustion processes. He is especially recognized for his pioneering work on the production of soot in combustion systems, including experiments, theory and detailed kinetic simulations.



Sought for his expertise, Prof. Bockhorn edited several important books that contend with combustion-generated soot and carbonaceous particles. He is also recognized as a highly effective leader of large research projects, including the recently successfully completed eleven-year project with the Collaborative Research Centre (CRC) on Non-Stationary Combustion.

In 1991, Prof. Bockhorn received the DECHEMA award for "outstanding contributions to the field of modeling interactions between turbulence and chemical reactions in chemically reacting flows." In 2012, he received the Gerhard Damköhler Medal of DECHEMA-GVC for "outstanding scientific contributions to combustion science."

About the Ya B. Zeldovich Gold Medal

The gold medal is named after Yakov Borisovich Zeldovich (1914-1987), a pre-eminent Soviet physicist. His far-reaching scientific achievements spanned many fields ranging from physical chemistry to nuclear and particle physics, and finally astrophysics and cosmology. Zeldovich worked on the theory of ignition,

combustion, and detonation. He achieved important results in the theory of nuclear chain reactions. He also discovered an oxidation of nitrogen mechanism, known in physical chemistry as Thermal NO Mechanism or the Zeldovich Mechanism

About the Jürgen Warnatz Gold Medal

The gold medal is named after Professor Jür- search approach on modeling and simulation gen Warnatz (1944-2007), a former managing of chemical reactive flows, particularly looking director of the Interdisciplinary Center for Sci- at the molecular reactions involved and entific Computing (IWR) at Ruprecht Karls Uni- transport processes. His life's work and publiversity, Heidelberg, Germany. He also served cations influenced the application of combusas a chair of the German Section of The Com- tion science around the world. bustion Institute. Warnatz pioneered a re-

Silver Combustion Medal

Awarded to Steffen Terhaar, Kilian Oberleithner, and Christian Oliver Paschereit

For the outstanding paper, Key parameters governing the precessing vortex core in reacting flows: An experimental and analytical study, presented at the previous International Symposium on Combustion.

Medalist's Biography

Steffen Terharr



Dr. Steffen Terhaar studied Aeronautical Engineering at the Technical University of Berlin, Germany and the ETSIA Madrid, Spain. In his master's thesis he developed a flight control system for the automatic landing system of a twoseated utility motor glider. After continuing in the field of flight control for another year as a research assistant, Dr. Terhaar joined the group of Prof. Paschereit at TU Berlin for a Ph.D. in gas turbine

combustion. He employed advanced laser diagnostics and analytical modeling to study the flow field and flame-flow field interactions of swirling combustor flows. His main research interests were fuel flexible and heavily diluted combustion systems, as well as the identification, modeling, and control of self-excited and acoustically driven flow instabilities. After Dr. Terhaar received his Ph.D. in 2015, he joined Alstom in Baden, Switzerland. Since the beginning of the GE-Alstom alliance, he is working as a Combustor Development Engineer for GE Switzerland.

Medalist's Biography **Kilian Oberleithner**



Dr. Kilian Oberleithner obtained a master's degree in Engineering Science from the Technical University of Berlin. His master's thesis was based on experimental research on swirling jets that he conducted in the laboratory of Prof. Israel Wygnanski, at TU Berlin. He continued researching the instabilities in swirling jets at the same university under the joint supervision of Prof. Oliver Paschereit and Prof. I. Wygnanski. Dr. Oberleithner

received his Ph.D. from TU Berlin in 2012 and continued research as a postdoc in Prof. Julio Soria's group in Melbourne, Australia until 2014. He is currently a research group leader at TU Berlin. His research interests are focused on exploring physical mechanisms and developing flow control techniques for reacting and non-reacting turbulent shear flows in general and in swirlstabilized combustion and thermoacoustics in particular, using stability theory, laser diagnostics, proper orthogonal decomposition and reduced order modeling.

Medalist's Biography **Christian Oliver Paschereit**



Prof. Oliver Paschereit has been the Chair of Fluid Dynamics, Hermann-Föttinger-Institut, Technical University of Berlin, Germany, since 2003. His research and teaching covers a broad spectrum of topics related to fluid mechanics and combustion technology: flow and combustion control, vessel aerodynamics, gas turbine technology, ultra-low NO_x combustion, thermoacoustics, pressure gain combustion and wind tur-

bine technology. Before moving to TU Berlin, Prof. Paschereit held an upper management position at ABB/Alstom, Switzerland, which he joined in 1994. From 1992 to 1994, he worked on highspeed train acoustics and helped to substantially reduce train noise. After his studies at TU Berlin and École Centrale de Lyon. France, he achieved his Ph.D. from TU Berlin and the University of Arizona. Prof. Paschereit's scientific and technology achievements are demonstrated by more than 400 journal and conference publications. The research has not only academic interest, but was also important for industrial applications documented in over 75 patent publications. A number of best paper awards, many research pieces, and an ERC Advanced Grant underline his competence in combustion and fluid dynamics.

About the Silver Combustion Medal

The Silver Combustion Medal recognizes an "science. First presented in 1958, at Oxford outstanding distinguished paper from the pre- University, UK, the Silver Combustion Medal is vious International Symposium on Combus- bestowed biennially to the authors of a selecttion. A distinguished paper selected for this ed paper during the International Symposium honor exemplifies quality, achievement, and on Combustion. significance to advance a field of combustion

Inaugural Hiroshi Tsuji Early **Career Researcher Award**

Awarded to Adam Steinberg

For demonstrated excellence in fundamental or applied combustion science research.

Winner's Biography

Prof. Steinberg is the McCharles Fellow at the University of Toronto, Canada, where he leads a team of researchers working in the fields of turbulent combustion, combustion dynamics, Steinberg said. "It is humbling to think about gas turbine engines, and laser diagnostics. He how much I do not know, even in the rather earned his Ph.D. in Aerospace Engineering from specific landscape of combustion diagnostics. I the University of Michigan, United States, and subsequently worked at the German Aerospace Center Institute of Combustion Technology before joining the University of Toronto in 2011.

Dedicated to research, Prof. Steinberg's work attempts to bridge the gaps between highfidelity laser diagnostics, deep data mining, and combustion phenomena at engine-relevant conditions, with particular emphasis on using high-repetition-rate diagnostics to describe and quantify causality.



"Beyond the great honor I feel about receiving the inaugural Hiroshi Tsuji award, it both inspires and enables me to keep learning," Prof. intend to use this award to foster new collaborations, opening new routes of inquiry for me and my students."

Bernard Lewis Fellowships

The Bernard Lewis Fellowship was established to encourage high quality research in combustion by young scientists and engineers. Fellowships are awarded biennially during the International Symposium on Combustion. Each recipient must be either a student or combustion scientist with an exceptional record of scientific research, an author and presenter of a paper accepted at the current symposium, and a member of The Combustion Institute.

2016 Recipients

Liming Cai is a graduate research assistant, Institute for Combustion Technology, RWTH Aachen University, Germany. In 2016, Cai earned his Ph.D. in Mechanical Engineering from the same university. His research is in chemical reaction kinetics of conv. and alt. fuels, including development of detailed reaction schemes, chemistry reduction, optimization, and uncertainty quantification.

Sili Deng is a Ph.D. candidate in Mechanical and Aerospace Engineering, Princeton University, United States. Deng's graduate work broadly encompasses kinetically-controlled phenomena in flames. Her major research has been in flame dynamics, including ignition and stabilization, and in soot, including PAH chemistry and soot-turbulence-chemistry interaction.

Luc Sy Tran is a postdoctoral researcher in the Department of Chemistry, Bielefeld University, Germany. In 2013, Tran earned his Ph.D. in Process Engineering and Products from the University of Lorraine, France. His research is in the effects of oxygenated biofuels on the characteristics of soot/soot precursors that form during the combustion of hydrocarbon fuels.

Shengkai Wang is a Ph.D. candidate in Mechanical Engineering (Ph.D. minor in Electronic Engineering), Stanford University, United States. Wang's graduate work is in laser diagnostics and shock tube kinetics. His research helped advance measurement of cavity-enhanced absorption to shock tubes kinetics. He has also led shock tube studies of important elementary combustion reactions.

Bo Zhou is a postdoctoral researcher in the division of Combustion Physics, Lund University, Sweden. In 2015, Zhou earned his Ph.D. in Combustion Physics from the same university. His research is in experimental studies of turbulent combustion using advanced laser-based diagnostics. His work provided the first experimental evidence of distributed reactions in highly turbulent flames.

About the Hiroshi Tsuji Early Career Researcher Award

tion science and has achieved a significant laminar and turbulent combustion. advancement in their field within four to ten

The Hiroshi Tsuji Early Career Researcher years of completing a doctoral degree or Award is co-sponsored by Elsevier and The equivalent. The award is named after Profes-Combustion Institute. The award recognizes an sor Hiroshi Tsuji, whose stable porous cylinder early career researcher who has demonstrated counterflow burner configuration has influexcellence in fundamental or applied combus- enced fundamental studies and applications in



Award Committees

Award committees have the honor and the responsibility to seek nominations and select winners among our international community of combustion scientists and practitioners. The Combustion Institute appreciates the indispensable service of each committee and the valuable time they have dedicated to recognize excellence in the field of combustion science.

Gold Medal Nomination Committee

Yiguang Ju, Chair, Princeton University, United States Henry Curran, National University of Ireland, Galway, Ireland Andreas Dreizler, Technical University of Darmstadt, Germany Bengt Johansson, Lund University, Sweden Mamoru Tanahashi, Tokyo Institute of Technology, Japan Margaret Wooldridge, University of Michigan, United States

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Hiroshi Tsuji Early Career Researcher Award Committee

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