



International Congress on Fracture (ICF) Announces Winners of 2017 ICF Medals

Shouwen Yu, President

David Taplin, Treasurer-Chief Executive Officer, President Emeritus

Alberto Carpinteri, ICF Awards Committee Chair

Each quadrennium, the International Congress on Fracture, ICF, the world's premier professional society of researchers pursuing the understanding and causes of fracture to prevent fracture and damage progression in engineering materials and structures, recognizes select members for their outstanding contributions to this important field of research. The field of Fracture and Structural Integrity is relevant to Aerospace, Power Generation, Chemical Process, Biomedical, Structural Materials, Electronics, and Recreation industries and in Geophysics and engages researchers in several academic disciplines. Four gold medals, and one silver medal named after pioneers in the field of fracture are presented at its quadrennial conference. The selection of winners was made by a committee consisting of past medal recipients.

The **Takeo Yokobori Gold Medal**, named after the founder of ICF, an outstanding researcher in the field, and the organizer of its first quadrennial conference in 1965 in Sendai, Japan, is presented to individuals who have excelled in research in the field of fracture and have also provided life-time service to ICF. Previous recipients of the medal are Professors David Taplin (2009), Yiu Wing Mai, Palle Rama Rao, and Teruo Kishi (2013).

Alan H. Cottrell Gold Medal is named after a pioneer in the field whose many scientific contributions in the field of micromechanisms of fracture are well known for decades and have provided deep understanding of fracture in structural materials. This award is presented to senior researchers in the field of fracture who have similarly made pioneering contributions to the understanding of the phenomenon of fracture. Previous recipients of this medal are Professors Robert O. Ritchie (2009), John F. Knott and Subra Suresh (2013).

George R. Irwin Gold Medal is named after the individual who is widely known as the "Father of Modern Fracture Mechanics" and whose work provided the scientific basis for this interdisciplinary field. This award is presented to a senior researcher whose

pioneering contributions have had lasting impact on engineering applications of fracture theories. Previous recipients of this medal are Professors Paul C. Paris (2009), James R. Rice, and John A. Hutchinson (2013).

Paul C. Paris Gold Medal honours the many pioneering contributions of Prof. Paul C. Paris to the field of Fracture Mechanics. His contributions in field of sub-critical crack growth include the discovery of the “Paris-Law” for fatigue crack growth. This award is presented to senior researchers whose pioneering contributions have had a lasting impact on structural integrity assessment methods. Previous winners of this medal include Professors Alberto Carpinteri and Y. Murakami (both in 2013).

Constance F. Tipper Silver Medal honours the memory and contributions of Constance Tipper who was a true pioneer in the field of fracture and the author of the popular book “The Brittle Fracture Theory”. The silver medal is awarded to a mid-career scientists/engineers who have made significant contributions in any aspect of research in the field of fracture. Previous recipients are Professors Julia King (Baroness Brown of Cambridge), Diane Lados, and Namrata Gundiah (all 2013).

In 2017, ICF named six scientists to receive its highest honour, the gold medals, and two mid-career scientists to receive silver medals. These medals will be awarded in a ceremony to be held at the Fourteenth International Conference on Fracture, ICF14, in Rhodes, Greece between June 18-23, 2017 (see www.icf14.org) for details of the conference.

Professors A. Toshimitsu Yokobori (Japan) and Emmanuel Gdoutos (Greece) are the co-recipients of the 2017 ICF Takeo Yokobori Gold Medal



A. Toshimitsu Yokobori



Emmanuel E. Gdoutos

Professor Yokobori, Jr. is Professor Emeritus of Tohoku University and Visiting Professor at Teikyo University in Japan. He has made seminal contributions in multiscale fracture analyses across nano, meso, to macro scales and is widely recognized for his contributions. His dislocation dynamics theory of fatigue crack growth and threshold stress intensity factor is cited in many books and review articles and is popularly known

as Yokobori's theory. He has also contributed extensively to characterizing fracture and crack growth at elevated temperatures and has led several national programs in these areas. The Q^* concept that he co-authored with his father, Prof. Takeo Yokobori, is based on a thermally activated theory of creep crack growth has enabled the prediction of creep crack growth rate and fracture life. Prof. Yokobori has served as the Secretary General of ICF continuously since 2001 and as a member of the ICF Council from Japan since 1989. He was named Fellow of ICF in 2013.

Professor Emmanuel E. Gdoutos serves as Full Member of the Academy of Athens, the most prestigious academic institute in Greece. He has made seminal contributions in the field of Experimental Mechanics, Fracture Mechanics, Nanotechnology and their applications to composite materials and sandwich structures for civil engineering structures. He has authored/co-authored more than 300 technical papers and 40 reference and text books, among them the book "Fracture Mechanics – An Introduction" used for fracture mechanics courses worldwide. He has served as President/Chair of several technical societies including the European Structural Integrity Society and conferences. He is member of European, American and foreign national academies and received awards from international societies. He was awarded a Doctorate Honoris Causa from the Russian Academy of Sciences and from the University of Nis, Serbia. He is the Sr. Vice President and Fellow of ICF and is the Executive Chair of ICF14 in Rhodes, Greece in June 2017.

Professor Michael F. Ashby (Cambridge University, UK) will receive the 2017 ICF Alan Cottrell Gold Medal



Michael F. Ashby

Professor Ashby is Emeritus Professor in the Engineering Department at Cambridge University in the U.K and the co-founder and Chairman of Granta Design, Cambridge, UK, a company specializing in Materials Informatics. He has made seminal contributions in the systematic materials selection and to the understanding of deformation in metals and its relationship to fracture mechanisms. His books on material selection are widely used throughout the world. He is the past ICF Honour Lecturer and an Honorary Fellow

of ICF. He is a Fellow of the Royal Society, the Royal Academy of Engineering. He was made an [CBE](#) in 1997.

Professor Robert V. Goldstein (A.Yu. Ishlinsky Institute for Problems in Mechanics of the Russian Academy of Sciences, Russia) will receive the 2017 ICF George R. Irwin Gold Medal



Robert V. Goldstein

Professor Goldstein is well known for his seminal contributions to understanding resonance phenomena accompanying interface crack propagation, for developing conditions of crack deviation in isotropic and orthotropic bodies, and for modeling the processes of formation of ordered crack systems under multiaxial loading. His contributions to qualitative methods of fracture mechanics led to estimates of the stress intensity factors for cracks of complex shapes and also sufficiency conditions for fracture in structural components. He developed a semi-empirical approach to fracture analysis of elastoplastic materials and suggested the similarity criteria for modeling fracture conditions of large-scale structures using results from testing their small-scale models. He has conducted innovative work in mechanics of ice and ice cover fracture under compression. Professor Goldstein has served ICF as Vice-President, Director, Member of Executive Committee and the Nominations Committee. He is Honorary Fellow of ICF (1993) and Emeritus Vice-President (2010).

Professors Richard W. Hertzberg (Lehigh University, USA) and Ashok Saxena (University of Arkansas, USA) are co-recipients of the 2017 ICF Paul C. Paris Gold Medal.



Richard Hertzberg



Ashok Saxena

Professor Richard Hertzberg is New Jersey Zinc Professor Emeritus and former Chair of Lehigh University's Materials Science and Engineering Department. His investigations emphasized the fatigue crack propagation (FCP) response in metals, composites, and polymeric solids. These investigations examined microstructural and atomistic variables in metal alloys; estimation of short crack behavior, utilizing K_{max} -constant test procedures; interpretation of macroscopic and microscopic fatigue fracture surface markings; and studies of overload interaction effects on FCP behavior. His and Dr. John Manson's pioneering studies associated with the FCP response of engineering plastics explored the role of molecular weight, second phase particles, test frequency, and identified unique fractographic features in polymeric solids. In addition, Prof. Hertzberg has had a distinguished university teaching career along with organizing and teaching numerous fracture mechanics short courses in Asia, Europe and U.S. His six textbooks on fracture mechanics and fatigue of engineering plastics are highly regarded. He is recipient of the TMS Educator Award, Fellow of ASMI, and numerous research and teaching awards.

Professor Saxena is a Distinguished Professor and Dean Emeritus in the Department of Mechanical Engineering at the University of Arkansas. His contributions to time-dependent fracture mechanics (TDFM) enabled its use in materials selection and in establishing criteria for reliability assessment and fracture resistance of high temperature components. His specific contributions include proposing, and validating the C_t parameter for predicting creep crack growth under small-scale-creep and transient conditions and its extension for use under simultaneous creep and fatigue loading. These developments have led to several international material test standards. He has held leadership positions in ICF as Vice President and the Awards Committee Chair. He is an honorary fellow of ICF and has received awards including the George Irwin Medal and the Fracture Mechanics Medal from ASTM and the Wohler Fatigue Medal from ESIS; he is an elected member of the European Academy of Sciences.

Professors Sylvie Pommier (University Paris Saclay) and Francesco Iacoviello (University of Cassini, Italy) are the co-recipients of the Constance Tipper Silver Medal





Sylvie Pommier

Francesco Iacoviello

Professor Sylvie Pommier serves as a Full Professor in the Department of Mechanical Engineering at Ecole Normale Supérieure Paris-Saclay (Université Paris-Saclay). She is recognized for her contributions to the advancement of nonlinear fracture mechanics for fatigue crack growth under complex loading conditions in metals and structures. She developed an incremental model for crack growth based on principal components analysis and the thermodynamics of irreversible processes. This method allows modeling of crack growth that is accompanied by non-linear material behavior with a formalism based on non-local state variables especially tailored for characterizing the non-linear behavior of the material around moving singularities, such as crack fronts, with the minimum possible independent degrees of freedom. The approach was applied to complex loading conditions (variable amplitude fatigue, non-proportional mixed mode loading, non-isothermal loading conditions, fatigue & oxidation) and various materials.

Professor Iacoviello serves as Professor in the Department of Civil and Mechanical Engineering at the University of Cassino, Italy. He is recognized for his contribution to mechanical metallurgy, specifically for his work on fracture and crack growth behavior of alloys such as duplex steels and ductile cast irons and the influence of environment on their performance. His work has led to a better understanding of the effect of chemical composition and microstructure on environmentally assisted fatigue crack propagation and the underlying micro-mechanisms, in air and in hydrogen charged conditions. His work on ductile cast irons has included characterization of the micro-mechanisms of damage development using a low cost and patented micro testing machine that he designed and developed allowing him to perform in situ SEM observations during the mechanical testing. He has been a long-term contributor to ICF including holding important leadership positions as ICF Director.



Pictures of Y. Murakami (left) and Alberto Carpinteri (right) receiving the Paul C. Paris Gold Medal from Late Prof. Paris at ICF13 in Beijing, June 2013.

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