BRIEF BIOGRAPHIES OF FESAC MEMBERS

Riccardo Betti has been a Professor in the Department of Mechanical Engineering and the Department of Astronomy and Physics at the University of Rochester since 2001. He is also the Director of the Fusion Science Center for Extreme States of Matter and Fast Ignition Physics, a position he took in 2004. He has also been a Scientist and Assistant Director of Academic Affairs at the Laboratory for Laser Energetics at the University of Rochester since 1991. He began his professional career as a Research Assistant at the MIT Plasma Fusion Center in 1987 and left there in 1991 to be an Assistant Professor in the Department of Mechanical Engineering at the University of Rochester from 1991-1996. From 1996-2000 he was an Associate Professor in the Department of Mechanical Engineering and the Department of Physics and Astronomy. Riccardo is a Fellow of the American Physical Society (2001-present).

Richard W. Callis is the Director of the GA-ITER Program at General Atomics, San Diego, CA. He received his PhD in Electrical Engineering from Carnegie-Mellon University in 1975 and his BS and MS from the University of California Irvine in 1969 and 1970 respectively. Richard has a broad background in fusion technology spanning from magnet design to high power microwave and radio frequency heating systems. He has been affiliated with the Doublet III and DIII-D tokamaks for 38 years and is presently responsible for manufacturing the ITER superconducting Central Solenoid magnets. Richard is a member of the IEEE and is a past chairman of the NPSS/IEEE Fusion Technology Standing Committee.

Bruce I. Cohen is a physicist and Associate Program Leader for Fusion Energy Sciences Theory and Computations at the Lawrence Livermore National Laboratory. His research interests are in theoretical and computational plasma physics, magnetic fusion plasmas and laser-plasma interactions with 148 peer-reviewed journal publications and was a co-editor/co-author of one book in computational plasma physics. He is a Fellow of the American Physical Society (1987). He has been a member of the Fusion Energy Sciences Advisory Committee since 2009. He has been an associate editor for Physical Review Letters and the Journal of Computational Physics. He has been a member of the Fusion Energy Sciences Advisory Committee since 2009. He has served on the APS Division of Plasma Physics Executive, Publications, Program, and Fellowship Committees. He received his PhD in theoretical plasma physics from University of California Berkeley in 1975 and was a postdoctoral researcher at the Princeton Plasma Physics Laboratory prior to joining Lawrence Livermore National Laboratory in 1976.

Raymond J. Fonck is the Steenbock Professor in Physical Sciences and a Professor of Engineering Physics at the University of Wisconsin-Madison. His research interests center on magnetically confined plasma sciences. They include: the properties of toroidally confined plasmas at near-unity aspect ratio; non-inductive startup and growth of high current plasmas; plasma stability studies at low aspect ratio; turbulence and related transport in magnetically confined plasmas; alternative fusion energy concepts; and high temperature plasma diagnostic development. Most of this work is motivated by the quest to develop thermonuclear fusion energy as a practical source of energy. His research experience includes research on small-scale alternative concept experiments in a university environment to active collaborations on several national and international class tokamak experiments. He was the founding Director of the national U.S. Burning Plasma Organization (20005-2007) and was *ex-officio* Chief Scientist of

the U.S. ITER Project Office. He has received several awards from professional and academic organizations: National Associate of the National Research Council of the National Academies; Steenbock Professor in Physical Sciences at UW-Madison; Fusion Power Associates Fusion Leadership Award; APS Excellence in Plasma Physics Research Award; and Fellow of American Physical Society. He has given advice to the government of the United Kingdom as a member of their UK Fusion Advisory Board (2009-2010), and to the U.S. government as co-chair and member of National Research Council studies on fusion research. He also was a member of the National Research Council Board on Physics and Astronomy (2003-2007). He served the U.S. government directly as the Associate Director of the Office of Science for Fusion Energy Sciences, U.S. Department of Energy (2007-2008). He received his PhD in Physics from the University of Wisconsin-Madison in 1978. He was a staff scientist at the Princeton University Plasma Physics Laboratory for 11 years before joining the UW-Madison faculty. He is an author on more than 190 journal publications on fusion plasma sciences, atomic physics, and applied optics.

Martin Greenwald is a Senior Research Scientist and Associate Director of the Plasma Science and Fusion Center (PSFC) at MIT. His research focuses on plasma turbulence and transport including detailed comparisons between gyrokinetic models and measurements of particle and energy transport; the role of quasi-coherent fluctuations on pedestal profiles and the role of boundary-layer turbulence and the plasma density limit. He leads the transport group for the Alcator C-Mod tokamak; heads the Office of Computer Services at the PSFC and leads the group responsible for data acquisition and data management. In this latter capacity he has led research and development aimed at improving the organization, utility and access to scientific data. He also participated in the conceptual design for the ITER control and data acquisition systems (CODAC). He has been recognized as an APS fellow and APS Distinguished Lecturer. He is the author of approximately 300 scientific articles. He received BS degrees in Physics and Chemistry from MIT and a PhD in Physics from the University of California at Berkeley.

Amanda Hubbard has been employed at the Massachusetts Institute of Technology Plasma Science and Fusion Center since October 1991. She was promoted to Principal Research Scientist in 2005 and she now holds multiple research responsibilities on the high field Alcator C-Mod tokamak. She is responsible for several diagnostics and the associated physics analysis, and has conducted extensive research on edge transport barriers and their transitions, giving a number of invited and review talks. Amanda began her professional career in July 1987 as a researcher at the JET tokamak in the U.K. following up on the work in her Ph.D. thesis on reflectometry and studies of particle transport and edge plasmas. In 1988 she was employed as a Research Physicist at Hydro-Québec until going to MIT in 1991. Amanda received her BSc in Math and Engineering in 1983 from Queen's University in Kingston, Canada. She received her PhD in Plasma Physics from Imperial College of Science and Technology, University of London in 1987.

Hantao Ji is a Distinguished Research Fellow at Princeton Plasma Physics Laboratory, and he also is a Lecturer of Graduate Program in Plasma Physics, Princeton University. He is also Associate Director of NSF Center for Magnetic Self-Organization (CMSO). He received his D.S. degree in physics from University of Tokyo in 1990, and has worked in National Institute for Fusion Science (Japan) and University of Wisconsin before joining PPPL in 1995. His current research interests are laboratory study of fundamental plasma physics processes common to

fusion plasmas and apace/astrophysical plasmas, including magnetic reconnection, angular momentum transport, dynamo action and turbulence. He is also interested in stability and heat transfer in free-surface liquid metal flows for fusion applications. He is a fellow of APS since 2004, and received Award for Excellence in Plasma Physics Research from APS in 2002, Kaul Prize for Excellence in Plasma Physics Research and Technology Development from Princeton University in 2003 and Outstanding Mentor Award from DOE in 2002 and 2010. He served as a Chair of Topical Group in Plasma Astrophysics, APS, during 2008-2009, and currently is serving as a member of Executive Committee of Division of Plasma Physics, APS. He also served in FESAC Toroidal Alternate Concepts Panel in 2008 and also as a Panel Lead for Magnetic Fusion Research Need Workshop during 2008-2009.

Christopher J. Keane has served as the Director of the NIF User Office at the Lawrence Livermore National Laboratory since 2008. Chris began his professional career at LLNL in the Inertial Confinement Fusion program. He served from 1996 to 2000 at the Department of Energy as the Associate Director of the Office of Inertial Fusion and the NIF Project. From 2000 until 2004 he served as the Director, Division of Secondaries and Inertial Fusion, in the National Nuclear Security Administration Office of Defense Science. From 2004-2007 Chris was the Assistant Deputy Administrator for Inertial Fusion and the National Ignition Facility Project, at NNSA. From 2007 to 2008 he was the Assistant Associate Director for Science and Technology, in the LLNL Physics Directorate. Chris received his BS Physics and a BS in Engineering from the University of Rochester in 1980. He received an MA and a PhD in Astrophysical Sciences from Princeton University in 1982 and 1986 respectively. Chris is a winner of the NNSA Silver Medal and the Stockpile Stewardship Program Award of Excellence.

Ramon J. Leeper has been the Department Manager for Diagnostics and Target Physics at Sandia National Laboratory since October 1986 managing an experimental inertial confinement fusion research group. He began his professional career in 1975 as a Research Associate at Iowa State University's Ames Laboratory. He moved to Sandia in 1976 as an Experimental Staff Physicist, moving up to his current position in 1986. He received an SB in Physics from MIT in 1970 and a PhD from Iowa State University in High Energy Physics in 1975. Ray holds a patent for Magnetically Insulated Diode for Generating Pulsed Neutron and Gamma Ray Emissions, and is a member of the American Physical Society. He has received the DOE Award for Excellence in 1999, and Lockheed Martin Corporation's NOVA Award in 2003.

Kathryn A. McCarthy has been the Deputy Associate Laboratory Director for Nuclear Science and Technology at the Idaho National Laboratory since 2007. She began her professional career in 1989 as a Guest Scientist in Karlsruhe, Germany. In 1989-1990 she was a Visiting Scientist at the Efremov Institute in the USSR. She went to the Idaho National Laboratory in 1991 and took on a series of positions with ever-increasing levels of responsibility culminating in the position she holds today. She received the Fusion Power Associates Board of Directors' Excellence in Fusion Engineering Award, the U.S. ITER Home Team Award, and the LMITCO Top Performance Award. She is a member of the American Nuclear Society.

Dale Meade is now consultant in the area of energy science as an expert in fusion energy with experience in the science of fusion plasmas and in the design, construction and operation of large magnetic fusion facilities. He was Deputy Director of Princeton Plasma Physics Laboratory, Head of the Tokamak Fusion Test Reactor (TFTR), the US's only DT fusion experiment, Head

of the Fusion Ignition Research Experiment (FIRE) design activity and Professor of Physics at the University of Wisconsin. He has received the DOE Distinguished Associates Award twice (1994 and 2005), the University of Wisconsin College of Engineering Distinguished Service Award (1990), the University of Wisconsin Physics Department Distinguished Alumnus (2002), the Fusion Power Associates Leadership Award (1999) and Distinguished Career Award (2005). He is a Fellow in the APS-DPP (1978) and AAAS (2002).

Ellen Meeks is Vice President of Product Development at Reaction Design, where she has led product development and engineering services for over 14 years and overseen the development of simulation technology targeting clean combustion. She has been the principal investigator on two Phase II Small Business Innovative Research projects, funded by the U.S. National Science Foundation and the U.S. Department of Defense, which have resulted in the commercialization of innovative technology for simulating uncertainty propagation and particle-size distributions in chemically reacting flows, respectively. In recent years she has also directed the Model Fuels Consortium, an industry-funded program that has focused on developing advanced methods for predicting fuel effects and emissions in automotive engine simulations. Previously, she spent 10 years as a researcher at Sandia National Laboratories in the areas of combustion, materials, and plasma processing. While at Sandia, she was a principal developer of the third generation CHEMKIN software, which enabled modeling of plasma-materials processes for semiconductor manufacturing. She is a mechanical engineer by training, with a Ph. D. from Stanford University and M.S. from Rensselaer Polytechnic Institute. Her publications include numerous journal articles and a book chapter; she holds two patents on reactor technology. She has had a career-long interest in applying computer simulation toward improving product design, increasing process efficiency, and reducing environmental impact.

Farrokh Najmabadi has been the Director of the University of California at San Diego Center for Energy Research since 2006. He has also been an Associate Professor and then a Professor of Electrical & Computer Engineering at UCSD since 2008. He has been responsible for overseeing and expanding the Center's research portfolio in energy research as well the administration of the Center. The Center has 18 Faculty and Senior Researchers as well as 25 PhD Students, and an annual funding level for research of more than $8 million. Farrokh received a BS in Electrical Engineering from Tehran University in 1976, and MS and a PhD in Nuclear Engineering in from the University of California at Berkley in 1977 and 19082 respectively. He is a member of the American Nuclear Society and the American Physical Society. He is a Senior Member of the Institute for Electrical and Electronics Engineers, and a member of both Tau Beta Pi and Eta Kappa Nu. He received in 2007 the IEEE Fusion Technology Award, 2004 the Fusion Power Associates Award for Leadership in Fusion Research, 2003 the UCSD Outstanding Engineering Professor award, 2002 the ANS Fusion Energy Division Outstanding Achievement Award, and in 1995 the David Rose Award of Excellence in Fusion Engineering.

Robert Rosner is William E. Wrather Distinguished Service Professor in Astronomy and Astrophysics and in Physics at the University of Chicago, and currently serves as one of the founding co-directors of the Energy Policy Institute at Chicago, as well as director of the Center for Exascale Simulations of Advanced Reactors. He is former President of University of Chicago Argonne, LLC, and former Chief Scientist and then Director of the Argonne National Laboratory. Previously, he served as Chairman of the Department of Astronomy and

Astrophysics at the University of Chicago, and Director of the University's Center for Astrophysical Thermonuclear Flashes. He was Rothschild Visiting Professor at the Newton Institute for Mathematical Sciences at Cambridge University in 2004. Rosner's research is in the areas of plasma astrophysics and astrophysical fluid dynamics and magnetohydrodynamics (including especially solar and stellar magnetic fields); high energy density physics; boundary mixing instabilities; combustion modeling; applications of stochastic differential equations and optimization problems; and inverse methods.

Dr. Rosner is a fellow of the American Physical Society and a foreign member of the Norwegian Academy of Science and Letters. He was elected a Fellow of the American Academy of Arts and Sciences in 2001 and serves as a member of its Council and as a Senior Advisor to its Global Nuclear Future Initiative.

Edward Thomas, Jr. is a Professor of Physics at Auburn University in Auburn, Alabama. He received a PhD in Physics from Auburn University in 1996, a MS from MIT in 1993 and a BS from the Florida Institute of Technology in 1989. His research involves the study of particle and energy transport in a variety of plasma environments. His work on complex (dusty) plasmas involves investigations of magnetic effects, instabilities, and the thermal properties of these systems. He also investigates the stability of magnetized plasmas in the presence of sheared flows with applications to space and fusion plasmas. Professor Thomas and his students have published over 60 scientific papers and made over 150 presentations at national and international scientific presentations. He has also served in a variety of advisory roles including the National Research Council – Plasma Science Committee, the University Fusion Association, and the American Physical Society.

Nermin A. Uckan is a Distinguished Research Staff and Program Leader for Advance Studies/Next Step Options at Fusion Energy Division of Oak Ridge National Laboratory (ORNL), Assistant Director for ITER Liaison with U.S. Burning Plasma Organization, and Editor of the *Fusion Science and Technology* (FS&T), an international journal of the American Nuclear Society (ANS) She has contributed to physics and engineering of magnetic fusion energy and has worked on plasma transport, plasma performance, plasma waves and current drive, burning plasma physics, plasma engineering, physics-safety interface, and fusion reactor studies She also taught a graduate level fusion physics, engineering, and technology courses at University of Tennessee-Knoxville. Her present research is in burning plasmas and fusion engineering sciences. She has published more than 200 technical papers/reports on these topics, as well as her widely used work on measures of plasma performance and physics design guidelines for ITER and reactors She has contributed to and participated in ITER activities from its inception and was responsible from coordination and publication of all ITER physics final reports and documents by the IAEA during the period 1988-1998. She received her PHD in Nuclear Engineering from University of Michigan-Ann Arbor in 1975 She is a fellow of ANS, member of APS, and recipient of numerous honors and awards for her academic work and research She received her B.S. and M.S. (1969) in Electrical Engineering from Technical University of Istanbul; M.S. (1973) in Nuclear Engineering, A.M. (1973) in Mathematics, M.S. (1973) in Computer Information and Controls Engineering, and Ph.D. (1975) in Plasma Physics/Nuclear Engineering all from the University of Michigan-Ann Arbor.

Steve Zinkle is the Chief Scientist of the Nuclear Science and Engineering Directorate and a Corporate Fellow at Oak Ridge National Laboratory His research interests include deformation and fracture mechanisms in structural materials and investigation of radiation effects in ceramics, fuel systems, and metallic alloys for fusion and fission energy systems. He received his PhD in Nuclear Engineering and an MS in Materials Science from the University of Wisconsin-Madison in 1985, prior to joining ORNL as a Eugene Wigner fellow He has written over 240 peer-reviewed publications, is a recipient of the 2006 U.S. Department of Energy E.O. Lawrence Award, and is a fellow of the American Ceramic Society, ASM International, The Minerals, Metals and Materials Society (TMS), American Nuclear Society (ANS), and the American Association for the Advancement of Science He also received the Fusion Power Associates Excellence in Fusion Engineering Award, the IEEE/Nuclear & Plasma Sciences Society Fusion Technology Award, the ANS Mishima Award, the Robert Cahn Award from Elsevier Ltd., and is a member of the U.S. National Academy of Engineering.

EX-OFFICIO MEMBERS

Fred Skiff is Professor of Physics in the Department of Physics and Astronomy at the University of Iowa. As a Hertz Fellow, he received his Ph. D. degree in physics from Princeton University with a thesis on linear and nonlinear plasma wave excitation. In 1985 he became a Research Scientist at the Plasma Physics Research Center (CRPP) at the Ecole Polytechnique in Lausanne Switzerland and performed fundamental plasma experiments on the dynamical chaos of ions in electrostatic waves using laser-induced fluorescence diagnostics. In 1989 he moved to the University of Maryland with a joint appointment in the Department of Physics and the Institute for Plasma Research and continued experiments on the kinetic degrees of freedom of plasmas and also developed and improved electron cyclotron wave absorption diagnostics for use on tokamaks. In 1998 he moved to the Department of Physics and Astronomy at the University of Iowa where he began experiments to quantify ion and electron phase-space fluctuations and transport. His research has been recognized by a Presidential Young Investigator Award, a Research Fellowship by the Alfred P. Sloan Foundation, and by being elected a Fellow of the American Physical Society in 2000. Currently he serves as chair of the American Physical Society's Division of Plasma Physics

John W. Steadman is currently the Dean of Engineering at the University of South Alabama, a job that he started in 2003. He is also serving at the NGO Representative for IEEE-USA. John received his BS in Electrical Engineering from the University of Wyoming in 1964. He went on to receive his MSEE and his PhD in Electrical Engineering both from Colorado State University in 1966 and 1971, respectively. John started his professional career as a research engineer at General Dynamics in San Diego in 1966 and stayed there until 1968. He received an NIH Special Research Fellowship from CSU where he worked from 1968 until 1971. John moved on to become a Professor at the University of Wyoming in 1971 and he moved upward in the ranks of Academia, finally serving as the Head of the EE Department from 1989 to 2003. During that time he also served as a Distinguished Visiting Professor at the US Air Force Academy from 1997-1998. John is a Fellow of the American Society of Electrical Engineers and the National Society of Professional Engineers. He also served as the President of the National Council of Examiners for Engineering and Surveying, and he is currently the President of IEEE-USA, a position in which he has served since 2004.

Minami Yoda is Professor of Mechanical Engineering at the Georgia Institute of Technology, where she has been a faculty member for more than 17 years teaching graduate and undergraduate students and doing basic research. Her research in experimental fluid mechanics and optical diagnostics focuses on interfacial transport, including the thermal-hydraulics of the plasma-material interface in fusion reactors, phase change in thermal management applications, and near-wall transport in microfluidic devices. Dr. Yoda's projects have been supported by various Federal agencies including the U.S. Department of Energy, the Army Research Office, the Air Force Office of Scientific Research, the Defense Advanced Research Projects Agency, the National Aeronautics and Space Administration, the National Science Foundation, and the Office of Naval Research. She is a Fellow of the American Society of Mechanical Engineers, and was a member of the 2006-07 Defense Science Study Group of the Institute for Defense Analyses. Dr. Yoda is currently the Chair of the American Nuclear Society (ANS) Fusion Energy Division, Associate Editor for the Springer journal *Experiments in Fluids*, and has served on the Executive Committee of the American Physical Society Division of Fluid Dynamics (APS/DFD). She was a von Humboldt Foundation and National Science Foundation postdoctoral fellow at the Hermann-Föttinger-Institute of the Technical University of Berlin in Germany, received her Ph.D. and M.S. in Aeronautics and Astronautics from Stanford University, and earned her B.S. in Engineering and Applied Science from Caltech. Dr. Yoda has published more than 60 journal papers and two book chapters, and her students' work has recognized by Outstanding Student Paper Awards at the ANS Technology of Fusion Energy meetings, the Gallery of Fluid Motion Poster Award from the APS/DFD, and the Best Student Paper Award in Animal Bioacoustics from the Acoustical Society of America.