Contributors

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Abhijit Biswas received his PhD from Southern Illinois University (Carbondale, Illinois) in molecular science in 1986. He has participated in optical communications technology development at JPL since 1992. Most recently Dr. Biswas served as the ground network systems engineer for the Mars Laser Communication Demonstration Project.

Chien-Chung Chen received his PhD from University of Illinois at Urbana-Champaign in 1987, where his dissertation was on free space optical communications. He joined JPL in 1987, and he has worked on both optical communications and deep space radio frequency (RF) systems development. He has extensive experience in both the development and operations of the deep space communications links. Dr. Chen is the principal investigator for the JPL Mars Laser Communications Demonstration Project.

Samuel J. Dolinar received his PhD in electrical engineering from the Massachusetts Institute of Technology (Cambridge, Massachusetts) in 1976, where his master's and doctoral theses were on optical communications. He worked at MIT Lincoln Laboratory, before joining JPL in 1980. Dr. Dolinar has focused his research on channel coding and source coding for the deep-space channel, especially turbo codes and low-density parity-check (LDPC) codes during the past decade. He teaches data compression at Caltech.

William H. Farr attended Caltech from 1976 through 1980, and has traversed a variety of fields including chemistry, neurobiology, electrical

engineering, and computer science, resulting in publications in seven fields. Prior to joining JPL in 2001, he worked for several engineering and high tech firms, including the Nucleonics Development Corporation, where he was head of the research and development department developing radioisotope and optical instrumentation for industrial monitoring applications, and had two patents. Mr. Farr is now the manager of JPL's Optical Communications Technology Program of the Interplanetary Network Directorate.

Andrew A. Gray received his PhD in electrical engineering in 2000, and his master of business administration (MBA) in 2004, both from the University of Southern California (Los Angeles). Prior to joining JPL in 1998, he worked at the NASA Goddard Space Fight Center for three years. He is a group supervisor in the Communications Architecture and Research Section. The primary focus of the group is development of first-to-the world prototypes for communications and radar systems. He holds three patents. Dr. Gray is also an affiliate faculty member at the University of Washington (Seattle, Washington).

Jon Hamkins received his BS from Caltech in 1990, and PhD from the University of Illinois at Urbana-Champaign in 1996, both in electrical engineering. Dr. Hamkins has been at JPL since 1996, where he is the supervisor of the Information Processing Group, which performs research in optical communications, information theory, channel coding, data compression, and synchronization.

Hamid Hemmati received his MS in physics from the University of Southern California, and his PhD in physics from Colorado State University (Fort Collins, Colorado) in 1981. Prior to joining JPL in 1986, he worked at the NASA Goddard Space Flight Center and at the National Institute of Science and Technology (NIST, Boulder, Colorado) as a researcher. He is now the supervisor of the JPL Optical Communications Group, which is developing laser-communications technologies and systems for deep space and satellite communications. Dr. Hemmati holds seven patents. He has taught optical communications courses at the University of California at Los Angeles (UCLA) Extension.

Chi-Wung Lau received his BS in physics from the University of California at Berkeley in 1996 and his MS in electrical engineering from the University of Southern California in 2001. He has been with JPL since 1996 involved with such projects as Deep Impact, the optical array receiver, and the telecom forecaster predictor tool. Mr. Lau is currently working on applying quantum theory to communications.

Shinhak Lee received his PhD from the University of Washington in electrical engineering in 1997, and he has been with JPL since then. He has made contributions to the acquisition, tracking, and pointing technology. Dr. Lee is a member of technical staff of the Optical Communications Group in the Communications Research Section.

James R. Lesh received his PhD from the University of California at Los Angeles in electrical engineering in 1976, and he has been with JPL since 1971. He has held numerous technical and managerial positions, including head of the Optical Communications Program, and currently he is the chief technologist and manager of the Technology Program of the Interplanetary Network Directorate. He holds three patents, and he has taught classes in communications theory, information theory, channel coding, and signal processing at Caltech. Dr. Lesh is a fellow of the Institute of Electrical and Electronics Engineers (IEEE) and of the International Society for Optical Engineering (SPIE).

Bruce E. Moision received his PhD from the University of California at San Diego in electrical engineering in 1999, and has been with JPL since 2000. He has worked primarily on the design and implementation of error correction codes and modulation schemes for optical communications links. Dr. Moision is a member of the Information Processing Group of the Communications Research Section.

Gerardo G. Ortiz received his PhD from the University of New Mexico in opto-electronic engineering in 1997, and he has been with JPL since 1987. He has made contributions to the development of high electron mobility transistor (HEMT) ultra low noise amplifiers for deep space radio frequency communications, multiple wavelength vertical cavity surface-emitting laser arrays for backbone networks, and acquisition, tracking, and pointing (ATP) technologies for free-space optical communications. Dr. Ortiz is a senior member of the staff in the Optical Communications Group.

Sabino Piazzolla received his PhD in electrical engineering from the University of Southern California in 1997. He has been at JPL since 2004, focusing on optical communications. Dr. Piazzolla is also a part-time faculty member at the University of California at Los Angeles, and at the University of Southern California.

William T. Roberts received his PhD in optical sciences from the University of Arizona in 2001. He has been with JPL since 2001. Dr. Roberts has focused his effort on development of deep-space communication lasers, flight qualification of communication terminal parts, and the conversion of

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Meera Srinivasan received her BS from Caltech in 1990, and her PhD from the University of Illinois at Urbana-Champaign in 1996, in electrical engineering. Dr. Srinivasan has been with JPL since 1996. Her research interests lie in the areas of optical communications, wireless and spread-spectrum communications systems, array signal processing, and detection and estimation theory.

Victor A. Vilnrotter received his PhD from the University of Southern California in electrical engineering in 1978, specializing in optical communications. Dr. Vilnrotter has been at JPL since 1979, and has conducted research in the application of optical and quantum communications to the deep space optical channel, electronic compensation for deep-space RF antennas via focal-plane signal processing, optical focal-plane detector arrays to mitigate atmospheric turbulence effects, and development and demonstration of fundamental optical array receiver concepts.

Keith E. Wilson received his PhD from the University of Southern California in 1980. Before joining JPL in 1988, he worked in laser research at Hughes Research Laboratories, Allied Corporation, and Litton Guidance and Control. He was a faculty member in physics at California State Polytechnic University at Pomona. Dr. Wilson has managed JPL's successful optical communications demonstrations with spacecraft. He is a principal engineer in the Communications Architectures and Research Section at JPL.

Malcolm W. Wright received his PhD in physics from the University of New Mexico (Albuquerque, New Mexico) in 1992, and was with the Air Force Research Laboratory researching high power lasers before coming to JPL in 1998. Dr. Wright's current work has focused on developing high power fiber lasers for downlink and uplink, space qualification of semiconductor and fiber based lasers and communication performance of various free space optical link demonstrations in the lab and the field.