

# **Brief History of the Shakti P. Duggal Award**

## **Bartol Research Institute**

After Shakti Duggal's death in 1982, his friends established a fund with its income to provide an award in Shakti's honor. In view of Shakti's long association with cosmic ray physics and his many contributions to the field during his career, the award is:

To recognize an outstanding young scientist  
for contributions in any branch of cosmic ray physics.

The first Shakti P. Duggal Award was presented at the 19<sup>th</sup> International Cosmic Ray Conference at La Jolla in 1985. Awards have been made at two-year intervals at each of the subsequent cosmic ray conferences.

The winners of the Duggal Award have all achieved recognition and prominence in their careers, as indicated by the list of their current positions:

Raymond J. Protheroe, 1985. (Deceased, July 1, 2015)  
Senior Lecturer, University of Adelaide, Australia.

Luke O'Conner Drury, 1987.  
Senior Professor in the School of Cosmic Ray Physics, Dublin Institute for Advanced Study, Ireland  
Member of the Royal Irish Academy.

Jeremy Lloyd-Evans, 1990.  
Senior Lecturer, Department of Physics and Astronomy, University of Leeds, UK

Todd Haines, 1991.  
J. Robert Oppenheimer Fellow, Physics Division Los Alamos National Laboratory, USA

Masahiro Teshima, 1993.  
Associate Professor, Institute for Cosmic Ray Research, University of Tokyo, Japan  
Director of the Max Planck Institute of Physics, Munich, Germany

Ocker C. DeJager, 1995. (deceased, December 14, 2010)  
Professor, Potchefstroom University, South Africa.

James Buckley, 1997.  
Professor Washington University, St. Louis, USA

Martin Pohl, 1999.  
Ruhr Universität, Bochum, Germany.  
Professor at Potsdam University and DESY-Zeuthen. Germany

Teresa Montaruli, 2001.  
Sezione INFN, Bari, Italy.  
Professor at the University of Geneva, Switzerland

Pasquale Blasi, 2003.  
Professor Gran Sasso Science Institute, L'Aquila, Italy and INFN/Laboratori Nazionali del Gran Sasso, Italy

Jim Hinton, 2005.  
Director, Max-Planck-Institut für Kernphysik, Heidelberg, Germany.

Diego F. Torres, 2007.  
Universitat Autònoma de Barcelona, Bellaterra, Spain.

Stefan Funk, 2009.  
Professor Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Lukasz Stawarz, 2011.  
Institute of Space and Astronautical Science, JAXA, Japan

Rolf Bühler, 2013.  
DESY-Zeuthen, Germany

Damiano Caprioli, 2015.  
University of Chicago, USA

Abigail Vieregge, 2017.  
University of Chicago, USA

Irene Tamborra, 2019.  
Niels Bohr Institute; Copenhagen, Denmark

Starting in 1991, the award winners have been invited to visit Bartol Research Institute of the University of Delaware to present a colloquium and discuss their work. Nominations are solicited by announcements in the first bulletins of the international cosmic ray conferences, which are issued well before the meeting and which receive a wide distribution. Nominations and letters of recommendation with supporting material are received at Bartol and distributed to an international selection committee. Each member of the selection committee returns written evaluations and a rank-ordered listing. In case of ambiguity in the outcome, a second round of consultation among the committee is invoked.

The Duggal Award has achieved the status of the premier award in the field of cosmic ray physics. The chairman of the Commission C4 on Astroparticle Physics of the International Union of Pure and Applied Physics is ex officio member of the selection committee, and the

other members are chosen to provide an international committee of leaders in the field that always includes one senior member of Bartol.

**Selection Committee for the previous Shakti Duggal Award** presented at the 36<sup>th</sup> International Cosmic Ray Conference, Madison, WI, USA July 25, 2019

Dr. Georgia De Nolfo (NASA-Goddard Space Flight Center)

Dr. Julie McEnery (NASA-Goddard Space Flight Center)

Dr. Piera Ghia (Laboratoire de Physique Nucleaire et des Hautes Energies, Paris)

Prof. Jamie Holder, (Bartol Research Institute, University of Delaware USA)

Prof. Elisa Resconi (Technical University Munich)

Prof. Martin Pohl (DESY-Zeuthen and Potsdam University)

Prof. Thomas K. Gaisser (Bartol Research Institute, University of Delaware USA)

Prof. Sunil Gupta (Tata Institute of Fundamental Research, Mumbai and Chair of IUPAP C4)

One way to get the flavor of the Duggal Award is to look at the presentation of the first award by Martin A. Pomerantz at La Jolla in 1985, which is reprinted on the next page.

Thomas K. Gaisser and Jamie Holder

## INTRODUCTION: Shakti P. Duggal Award Presentation, 1985

When in 1959, Vikram Sarabhai wrote asking whether a post-doctoral appointment at Bartol might be available for his fine young student, he received an affirmative response by return mail. Shakti P. Duggal took up his appointment as a Bartol Fellow the following year, and for the next 22 years, he continued to make important contributions to cosmic ray physics in the field which at this International Cosmic Ray Conference is designated solar-heliospheric SH.

He had become a well respected member of our community when his brilliant career was cut short at its peak by his untimely death in 1982, at the age of fifty. He had been an active participant in, and contributor to, then of these Conferences, commencing with the 8<sup>th</sup> ICRC in Jaipur in 1963, and ending with the 17<sup>th</sup> ICRC in Paris in 1981. The outpouring of his colleagues from around the world upon learning of his premature passing testifies to the high regard in which he was held, and the genuine affection of all who were fortunate enough to know him.

As a fitting memorial, Shakti Duggal's colleagues and friends established an international award for outstanding work by a young scientist in the field of cosmic ray physics. The recipient of the First Biennial Award has been selected by a committee consisting of M. Casse, A.E. Chudakov, P.H. Fowler, M.A. Pomerantz, J.A. Simpson, and A.W. Wolfendale. I take this opportunity to express deep appreciation to my colleagues on this committee for carrying out the exceedingly difficult task of making a selection among the many outstanding young people who have already attained prominence in our discipline.

With great pleasure, I call upon Professor John R. Prescott to introduce Raymond J. Protheroe as the first recipient of the Shakti P. Duggal Award.

Martin A. Pomerantz  
Bartol Research Foundation  
Of the Franklin Institute  
University of Delaware