

ABOUT AGU

Bruce T. Tsurutani Receives 2009 John Adam Fleming Medal

Bruce T. Tsurutani was awarded the 2009 John Adam Fleming Medal at the AGU Fall Meeting Honors Ceremony, held on 16 December 2009 in San Francisco, Calif. The medal is for "original research and technical leadership in geomagnetism, atmospheric electricity, aeronomy, space physics, and related sciences."

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Citation

Bruce Tsurutani has made remarkable contributions to the study of plasma waves at Earth, planets, and comets; to space weather; to magnetotail dynamics; to collisionless shock physics; and to ionospheric perturbations resulting from flares and penetrating solar wind electric fields. But Bruce has taken each of these topics further to examine the consequences as they ripple through the highly connected Sun-Earth system.

He (and colleagues) did the initial and fundamental work in identifying the mechanisms by which geoeffective solar wind disturbances are amplified in the heliosphere to drive extreme events at Earth. However, Bruce's research into the causes of space weather led him in another direction as well. He demonstrated that low solar activity (indicated by low sunspot numbers) did not necessarily mean low magnetic activity at Earth. He discovered that energy input to geospace during years of strong high-speed stream activity could actually exceed the energy input from the short-lived but intense active region eruptions during solar maximum years. His identification of Alfvén waves as the geoeffective feature in the coronal hole wind drove another breakthrough in our understanding. Most recently he is following space weather impacts down into the ionosphere, examining disruptions that challenge critical communications and navigation systems during extreme events.

A curiosity about how severe a space storm could become drove Bruce to investigate one of the strongest magnetic storms in recorded history, the Carrington event of 1859. A press release was taken up by the news media and even made it onto national television, kicking off a comedy segment reporting "weather" on the Sun. The publicity, and the interest and goodwill it generated, was invaluable. His paper on this storm was ultimately used as part of the basis for a National Academy of Sciences study report on the economic impacts of space weather.

As impressive as Bruce's work has been, his leadership may actually be his greatest legacy. He served terms as secretary, president-elect, and president of the Space Physics and Aeronomy (SPA) section of

AGU. During this service, he initiated major SPA lectures, a Ph.D. student award, and the revision of the entire AGU index terms. He organized four Chapman Conferences along with a variety of workshops. Many of the resulting publications have become standard references in heliophysics.

Bruce's leadership also extends into the international community. One of the true merits of his collaborations with scientists worldwide has been his openness and collegiality, earning him their respect and appreciation and making him an important emissary for U.S. science abroad. Over the same time interval that Bruce received a half dozen NASA recognition awards for work on U.S. space missions, he also received the Latin American Geophysical Society Gold Medal and the Brazilian National (Von Braun) Space Medal.

In summary, Bruce has enriched our field through his own research, the ways he has involved the community in that research, and his leadership. This is an excellent opportunity to honor an individual whose career and contributions go right to the heart of the Fleming Medal.

—JANET U. KOZYRA, University of Michigan, Ann Arbor

Response

Thank you, Janet, for your generous and kind words. It is particularly pleasing to have these come from a colleague and highly productive scientist whose work and work ethic I admire. I want to thank Kinsey Anderson of the physics department and the many fellow graduate students and postdocs at University of California, Berkeley for initial guidance along my path toward becoming a useful and productive scientist. Kinsey told his students to always remember to have fun while doing science, words of wisdom that I have cherished. I pass this on to the younger generation out there.

I have had the great fortune to be at an institution (only one in my career), the Jet Propulsion Laboratory, California Institute of Technology, that not only fostered my career in space plasma research but also encouraged me to interact intensively with those outside the institution and the country. I have had the very good fortune to partner with great minds in countries like Brazil, Japan, Portugal, Germany, India, and many others.



Bruce T. Tsurutani

The axiom "two heads are better than one" is certainly a truism if they are able to work together as an equal-partnership team. My publications almost always involve one or several other authors, and I therefore view this award as being a collective one.

I was lucky to come up at a time near the beginning of the space age. I met, and in some cases worked with, giants like Chapman, Alfvén, Forbush, Simpson, Van Allen, Obayashi, and Bryce. These people were "straight-shooting" pioneers who were simply trying to solve the puzzles of nature. Whether they realized it or not, they were role models for me and my generation.

One incurs debts as one moves along the path of life. University training often comes at great expense (mine certainly did). My institution (and eventually the public) has helped me do what I wanted to do scientifically throughout my career. It even paid me for it! These debts should be repaid. It was a great pleasure working with AGU as an officer and in other capacities. In some of these functions, I was able to "facilitate" some of my fellow scientists to help them expose their scientific results and at the same time repay some of my debt. I hope that I am getting close to even on the debt sheet now.

Finally, I would like to thank my ever sharp, gentle, 96-year-old-mother and my deceased attorney father (who forced me to go to university), and my wonderful wife, Olga, for moral support over the years. I am grateful to Ansel Adams for an early birthday photo (under trying circumstances) documenting our humble beginnings. The United States allows one the opportunity to become what one wants to, for which I am very grateful. I hope that I have been a good representative for my ethnicity in return. I also thank my friends (both in and out of science) and colleagues for their continued support. One could hardly ask for more in life. In conclusion, it is a great pleasure and honor for me to accept the AGU John Adam Fleming Medal for 2009.

—BRUCE T. TSURUTANI, Jet Propulsion Laboratory, California Institute of Technology, Pasadena