



Physikalisches Kolloquium

Wintersemester 2024/25

Dienstag, 15. Oktober 2024 um 16:45 Uhr
Hörsaal MS 3.1, Physikzentrum, Mendelssohnstraße

Dr. Bruce T. Tsurutani

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A Long and Winding Path Through Space Weather Research

Solar Flares, Disappearing Filaments, Coronal Holes, CMEs/Driver Gases, CIRs, Magnetic Clouds, Filaments, High-Speed Streams, Nonlinear Alfvén Waves, Magnetic Reconnection, Viscous Interaction, Forward and Reverse Shocks, Storm Sudden Commencements/Sudden Impulses, Auroras, Substorms, HILDCAAs, Chorus Waves, Relativistic Electrons, Magnetic Storms, Superstorms, The Carrington Event, Supersubstorms, GICs

About 5 years ago, as an oldster, I was asked to write my scientific bio with the aim of coming up with pointers to help young people with their careers. I thought about it and realized that things had changed so much from the time when I started my career to the present, that I felt that I would not have much to say that would be useful to young people today. In the interim I have read others with great interest. Everyone's story was different and that the stories did have great (and different) messages for young people. So I have now reconsidered the idea of talking about and writing my bio. I will only do it on one topic that I have been interested in for a long time: Space Weather. Otherwise my meanderings would be even more disjoint than this talk/article will be. In the 1960s and 1970s the community was quite small and everyone knew everyone else (or at least who they were). Everyone addressed each other by their first names with no titles used. I will do the same here and will introduce encounters with some of our scientific "luminaries" that were instrumental in my career.

One might wonder why the very long subtitle? I have found that many space weather phenomena are related to others. I will cover all of the subtitle topics in my meanderings. However I will almost start with the Axford and Hines (1961) viscous interaction concept and almost end there: a full circle.

One of the "luminaries" that I will mention, my thesis advisor at University of California at Berkeley, Kinsey Anderson, said "whatever you do while doing science, have fun". This is about the best piece of advice that I can pass down to you no matter what path you take, doing detailed data analysis research, theory or management. **Moral #1. Listen to your elders. They can give you great advice! Sometimes.**

<https://www.tu-braunschweig.de/physikalisches-kolloquium>

Für die Dozenten der Physik: Prof. Dr. Yasuhito Narita, Tel.: 0531 391 5186

Steckbrief - Dr. Bruce T. Tsurutani



Dr. Bruce Tsurutani (PhD at the University of California at Berkeley in 1972) is an emeritus research scientist at the NASA/California Institute of Technology's (Caltech) Jet Propulsion Laboratory (JPL) in USA. Dr. Tsurutani has spent much of his research career over 50 years on understanding the Sun-Earth connection and interplanetary physics. In 2009 he was awarded John Adam Fleming Medal by American Geophysical Union (AGU), given for “original research and technical leadership in geomagnetism, atmospheric electricity, aeronomy, space physics, and related sciences.”

Dr. Tsurutani has advanced experimental space physics with a dozen of satellite programs: interplanetary missions (ISEE, Ulysses, Pioneer 10 and 11), Earth and planetary missions (Polar, Cluster, Cassini), cometary missions (ICE, Giotto, Sakigake, Rosetta). His scientific interests are widespread which include space weather, solar physics, fundamental plasma processes (waves, shocks, nonlinear processes), ionospheric and magnetospheric physics, and auroral phenomena. Dr. Tsurutani has written over 800 papers in refereed journals with over 40'000 citations and an H index of 103, outstanding achievement by any standard.

In this colloquium talk, Dr. Tsurutani describes how he approaches scientific problems along with the space weather research history. Dr. Tsurutani is known for the results from one of his most groundbreaking papers, which investigated the Carrington event in 1859, the most energetic geomagnetic storm to have collided with the Earth in recorded history.

