

Applied Physics Laboratory

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29th April 2010

Dr Walter Schmidt
Metnet Science Team Lead
Finnish Meteorological Institute

Dear Dr Schmidt

This letter constitutes my proposal to serve as a member of the Metnet Science Team, per the instructions on the Metnet web page. I am very excited by this bold and innovative mission and believe I bring useful skills, ideas and experience to bear : I attach a brief CV on the next page.

Presently I am project scientist on TiME (Titan Mare Explorer), a mission being proposed for the upcoming NASA Discovery mission solicitation : I also lead its MP3 (Meteorology and Physical Properties Package) instrument, which includes a pressure sensor to be provided by Ari-Matti Harri of FMI. Dr Harri will recall that I worked on the Huygens probe (since 1990) at both ESTEC and at universities, and was also involved in Mars Polar Lander. Perhaps most relevant for Metnet, I was selected in 1998 by NASA to be on the science team for the New Millennium DS-2 Mars Microprobes, a project with rather similar philosophy to the Metnet Precursor Mission. While DS-2 was unsuccessful, some important lessons can be learned.

I appreciate the challenges and opportunities of working on a diverse team, and I can adapt my proposed efforts to complement the rest of the science team. I would be interested in analyzing the entry dynamics to recover a density profile and the behavior of the novel Metnet system - the examination of magnetometer data in conjunction with accelerometer data is a new possibility here. My work on DS-2 centered on impact dynamics, which is also an area to which I could contribute. During the landed phase, I would be interested in searching for dust devil signatures (I am funded to study these on Earth with innovative data logging systems) and in the analysis of Metsis data to determine the vehicle position.

I anticipate soliciting support for my involvement via Mission-of-Opportunity proposal to NASA once the project ramps up in activity level. To that end, an indication of number, location and duration of anticipated Metnet science team meetings would be useful in due course.

Sincerely



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Ralph D. Lorenz - Curriculum Vitae

Current Position

Space Department, Johns Hopkins University Applied Physics Laboratory, Laurel, MD 20723

Education

1990 – University of Southampton, England – B.Eng., Aerospace Systems Engineering

1994 – University of Kent at Canterbury, England – Ph.D., Physics

Research Area

Dr Lorenz has broad interests in planetary surface-atmosphere interactions (with a focus on Titan), climate, radar and in-situ instrumentation, and aerospace vehicle dynamics.

Selected Professional Positions and Experience

- 1990-91 – YGT, Huygens Project Team, European Space Agency, Noordwijk, Netherlands.

- 1994-06 – Research Associate, Lunar and Planetary Lab, University of Arizona, Tucson, AZ.

- 2006-present – Senior Professional Staff, JHU Applied Physics Lab, Laurel, MD.

Science Team Member – New Millennium DS-2 Mars Microprobes 1997-2000

Co-Investigator – Huygens Surface Science Package 1994-2008

Science Team Member – Cassini RADAR 2000-present (Associate TM 1997-2000)

Professional Achievements/Awards

NASA Group Achievement Award, Cassini Program SSP Team, 1998

NASA Group Achievement Award, Huygens Descent Trajectory Working Group, 2006

Sagan Lecturer, American Geophysical Union, 2007

SDT Co-chair/Study Scientist – NASA 2007 Titan Explorer Flagship Study

NASA Group Achievement Award, Cassini Titan Integration Science Team, 2008

Professional Societies

American Geophysical Union, Royal Aeronautical Society, AIAA, Royal Astronomical Society

Selected Publications

(Over 160 publications in the refereed literature, 5 co-authored books, 2 co-edited books)

J. Ball, J. R. C. Garry, R. D. Lorenz and V. V. Kerzhanovich, *Planetary Landers and Entry Probes*, Cambridge University Press, March 2007.

R. D. Lorenz and J. Mitton, *Titan Unveiled*, Princeton University Press, April 2008.

D. M. Harland and R. D. Lorenz, *Space System Failures*, Praxis-Springer April 2006

R. D. Lorenz, *Spinning Flight : Dynamics of Frisbees, Boomerangs, Samaras and Skipping Stones*, Springer/Copernicus, September 2006

R. D. Lorenz, C. P. McKay and J. I. Lunine, Photochemically-Driven Collapse of Titan's Atmosphere, *Science*, 275, 642-644, 1997

R. D. Lorenz, Design Considerations for Venus Microprobes, *Journal of Spacecraft and Rockets*, 35, 228-230, 1998

R. D. Lorenz et al, The Sand Seas of Titan : Cassini RADAR observations of Longitudinal Dunes, *Science*, 312, 724-727, 2006

R. D. Lorenz, et al, Descent Motions of the Huygens Probe as Measured by the Surface Science Package (SSP) : Turbulent Evidence for A Cloud Layer, *Planetary and Space Science*, 55, 1936-1948, 2007.

R. D. Lorenz, Power Law of Dust Devil Diameters on Earth and Mars, *Icarus*, 203, 683-684, 2009

R. D. Lorenz, Attitude and Angular Rates of Planetary Probes during Atmospheric Descent, *Planetary and Space Science*, 58, 838-846, 2010