# YOUNG SCIENTIST AWARD (DONATH MEDAL)

**Presented to**
**Jasper A. Vrugt**

Jasper A. Vrugt
*University of California at Irvine*

### *Citation by Terry Wallace*

The Donath Medal is named for a truly remarkable earth scientist who made fundamental contributions to our understanding of rock rheology, and proved unambiguously the role of fluids in controlling the mechanical properties of rocks. It is fitting that the 2011 recipient of the GSA's Donath Medal is a remarkable scientist who also has made deep contributions to our understanding of the fluids in the Earth. Dr. Jasper Vrugt is an outstanding computer modeler who has taken on the very challenging task of bridging the theoretical understanding of environmental systems with the often confusing experimental data that is collected both in the laboratory and in the field. Jasper has the uncanny ability to find the scientific "soft spots" that prevent progress and craft solutions that move the field forward. Recent examples include Jasper's innovations in quantifying conceptual model uncertainty and his path-breaking new concepts for advancing the field of evolutionary optimization, stochastic inversion, and Bayesian statistics. He has brought to practice his theoretical advances, often in the form of new numerical techniques for exploiting high-performance computing to the study of natural systems, through self-initiated collaborations with others in the field. The quality and scientific diversity of his list of collaborators is remarkable, a testament to the excellence of his science and an uncommon desire and skill in engaging world-class scientists. A recurring theme for Jasper is to pursue fundamental advances and then to apply these breakthroughs to real-world applications in a variety of different fields. Although he is a numerical modeler by current practice, his ability to craft solutions to real earth science problems is a testament to his creativity and collaborative spirit and points our field in a direction in which new levels of fundamental understanding can be attained through the concerted integration of experiments and observations, theory, and modeling.

I am extremely pleased that GSA has honored Dr. Jasper Vrugt as a recipient of the Young Scientist Award; I expect that future contributions will be even more extraordinary!

### *Response by Jasper A. Vrugt*

It is a great privilege and honor to receive this prestigious medal of the Geological Society of America (GSA). I remember very well my first trip to the United States on an Iceland Air Boeing jet on October 17, 1998. The boarding embarked a long and exciting journey and headed off the start of an unimaginable journey that has led me to visit many places in the world, where I have been blessed to come in contact with some remarkable and extraordinary people. They exude enthusiasm for my research and work, and have provided important guidance and valuable advice when I was lost on an odyssey of personal discovery and cultural differences within the realm of model – data merging.

I remember very well my excellent education at the University of Amsterdam (UvA), and setting up my multi-step outflow experiments in the laboratory to describe and predict soil moisture flow through variably saturated porous media. This soon led to numerical modeling and ultimately led us to understand why so many studies demonstrated non-uniqueness of the hydraulic functions. My PhD research at the UvA forced me in yet uncharted waters and led to extended visits to UC Davis and the University of Arizona, Tucson to work with experts in environmental modeling, hydrogeology, optimization, and data assimilation. Later, my Oppenheimer Fellowship at Los Alamos National Laboratory provided an unprecedented opportunity and helped me to embrace a career outside Europe, far away from my family, friends and childhood. This appointment and the many extraordinary colleagues and friends at LANL have been paramount to receiving this recognition. My current position at UC Irvine provides a wonderful educational and research environment under the sunny skies of Southern California. Teaching is a nice break from my research and it is a pleasure to interact with the young and energetic minds of students.

I reckoned early on that to really do something substantial, I should embark upon a journey and leave my hometown, friends, family and culture to go to the States, and work with people there. But, the idea was never to win awards. I just wanted to do what I really liked to do and try to help others along the way. If there is one thing I am proud of then it would be that many of the model-data synthesis algorithms we developed over the past years are used widely in many different scientific disciplines. This is a very rewarding experience, and has resulted in publications on a wide range of topics including ecology, bird migration, hydrogeology, soil physics, hydrology, agriculture, and atmospheric chemistry. And today, with all the attention and recognition the Donath Medal brings with it, I am humbled.

No one can succeed alone, and I have been fortunate to have the proverbial village behind me. I would not be here today without the encouragement of others and the many opportunities they provided which helped to jumpstart my research, publications and career. I have been blessed by counting many of you not only as my mentors but, also as good friends. I would like to mention Willem Bouten, Sierd Cloetingh, Hoshin Gupta, Soroosh Sorooshian, Shlomo Neuman, Jan Hopmans, Rien van Genuchten, Cajo ter Braak, Cees Diks, Steve Burges, Keith Beven, Martyn Clark, Jim Freer, Rafael Bras, Bruce Robinson, Ty Ferre, Sander Huisman, Harry Vereecken, Terry Wallace, Mac Hyman and George Zyvoloski. Without your advice, help, and support I simply would not be here.

My girlfriend, Kirstin and her pug dog, Norman Bean, remind me every day that there is more in life than just work, data, priors, algorithms, and posteriors.

The unconditional love of my parents has been instrumental at all stages of my life. Their care, steadfastness and never ending support, have provided a very solid foundation on which I was able to build and succeed. My years in America have been wonderful – and I owe that to the fantastic support of my family back home - allowing me to keep my feet in both worlds. Thank you Mom and Dad!

In closing, I would like to thank my

nominators, citationist, and the GSA Donath Medal Committee for selecting me to receive this award and honor. It is my hope that my students, collaborators, and I can continue to produce meaningful research and publications.

View the images from Jasper Vrugt's Gold Medal Lecture at http://www.geosociety.org/awards/11speeches/GML-Donath.pdf