



Award

2006 Nier Prize for Matthieu Gounelle

The Meteoritical Society has awarded the 2006 Nier Prize to Dr. Matthieu Gounelle. This prize, which was established in honor and memory of Prof. Alfred Nier, recognizes outstanding research in meteoritics and closely allied fields by young scientists.

Matthieu Gounelle received a Masters degree in physics from the University of Paris VII in 1994. Shortly thereafter, he joined the Laboratoire d'Optique de l'Ecole Supérieure de Physique et de Chimie in Paris and started working on gravitational waves, as part of his mandatory national military service. (This work subsequently resulted in his first scientific publication in 1996.) In 1995, Gounelle broke off his physics studies in Paris in order to pursue a strong interest in philosophy. He studied one year at Trinity College in Cambridge and wrote a thesis entitled "Machines and human nature at the end of the 18th century" under the supervision of Dr. Simon Schaffer. Upon his return to Paris in 1996, Gounelle began to work on a Ph.D. thesis in theoretical physics on the subject of rock fracturing. After six months, he was utterly bored with this topic. Michel Maurette became his savior, a new Ph.D. advisor and a mentor in the years that followed. Under Maurette's command, Gounelle was immediately dispatched to Antarctica to collect micrometeorites at Cap Prudhomme, a base operated by the Institut Polaire Français. Subsequently, Maurette guided Gounelle through a rewarding Ph.D. thesis during which lasting collaborations were established with, among others, Mike Zolensky and Frank Shu. Gounelle received his Ph.D. in 2000 from the Paris VII University with a thesis entitled "Matière extraterrestre sur Terre: des protoétoiles aux océans". Right thereafter, he joined the Natural History Museum in London to work with Sara Russell and colleagues in their newly established ICPMS facility. After two years in London, Gounelle returned to France to take a position at the University of Paris XI. In 2005, he moved to the Muséum National d'Histoire Naturelle in Paris.

Gounelle has made significant theoretical and experimental contributions to the fields of meteoritics and cosmochemistry. An incomplete list includes:

- Theoretical calculations of nuclear effects triggered by energetic particles emanating from the early Sun with implications for the production and distribution of short-lived radio-nuclides in the solar nebula, the origin of chondrules and CAIs, and solar system chronology. Gounelle made a prediction on the abundance of ^7Be ($T_{1/2}$



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= 53 days) in early solar system solids, in support of which experimental evidence is now mounting.

- Orbital determination for the Orgueil CI chondrite fall in France, May 14th 1864. The calculated orbit, which is based on a critical evaluation of eyewitness reports, points to a cometary origin for the Orgueil meteorite. This remarkable finding suggests that all CI chondrites are of cometary descent, which would extend the provenance of meteorites to the icy outskirts of the solar system. Indeed, we may have had macroscopic samples from comets in our collections all along!
- The discovery of "fossil" micrometeorites, present as clasts of CM-like material in differentiated meteorites (howardites). The mineralogy and average D/H ratio of water trapped in these fossil micrometeorites imply great similarity to the modern Antarctic micrometeorite population and suggest that this population of solar system dust is similar to the material that provided water on Earth.

- A socio-historical analysis of the circumstances surrounding the l'Aigle meteorite fall in France, April 26th, 1803. In this work, Gounelle makes the connection between science and the French political scene in the early 19th century. He demonstrates how the systematic fieldwork performed by Jean-Baptiste Biot, who was sent to investigate the l'Aigle fall as a representative of the centralized Bonaparte administration, was equally important to the acceptance of meteorites as extraterrestrial objects as was the work by Chladni and Howard.

For this research effort, for its remarkable span of theoretical astrophysics, mineralogy and history, for the readiness to challenge established paradigms, and for the love of meteoritics that propels it all: Matthieu Gounelle is a worthy recipient of the 2006 Nier Prize.

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