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Press release

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The Crafoord Prize in Geosciences 2010

The Royal Swedish Academy of Sciences has decided to award the Crafoord Prize in Geosciences 2010 to

Walter Munk

Scripps Institution of Oceanography,
University of California, San Diego, La Jolla, CA, USA

"for his pioneering and fundamental contributions to our understanding of ocean circulation, tides and waves, and their role in the Earth's dynamics".

The Moon, of Course

The great adventure of exploring the world's oceans took place largely in the latter half of the 20th century, when new technology and novel methods of remote analysis had become invaluable tools for oceanographers.

This year's Crafoord Prize Laureate, **Walter Munk**, is a person who, in his work of explaining ocean circulation, tides and waves, and their role in our planet's dynamics, moved in the absolute forefront of science throughout this period. In particular, Munk's grasp of the tide's significance, on various scales is crucial to his scientific oeuvre. 'The Moon, of Course' might well serve as a shorthand title for several of the achievements for which this Prize is now being awarded to him.

Walter Munk has devised and developed mathematical models in oceanography for everything from *wave* and *tide* forecasting and *internal waves* to *wind-driven circulation* in the ocean. His work on tides and how internal waves arise in oceans has been crucial to our understanding of how water masses in the oceans undergo mixing at great depths.

By developing entirely new observation methods, such as *acoustic tomography* and the technique of *analysing photographs of solar reflection from the ocean surface*, Munk has also extended humankind's scope for measuring and describing the oceans. It may be mentioned, as an example of Munk's innovativeness and scientific breadth, that he has also approached the subject area of biology through his calculations of how plankton absorb nutrients from the sea by means of diffusive processes. This work was before its time in 1952 but has, in ecological modelling, been cited increasingly in recent years.

Walter Munk has made invaluable contributions to our understanding of the dynamics not of the oceans alone, but of the entire globe. In 1960, thanks to his geophysical approach, Munk was able to describe irregularities in the Earth's rotation in a way that was, at the time, entirely new. He discussed polar movement and variations in the Earth's rotation speed on various timescales and was able to show that, over a century or more, the friction of the tide is what most affects the Earth's rotation, by causing its gradual deceleration. Nowadays, the consequent gradual lengthening of the Earth's day is taken into account in the calculation of Coordinated Universal Time (UTC), with the addition of an extra 'leap second' in certain years. Owing to this deceleration of the Earth's rotation, the Sun and Moon are also moving away from the Earth. The increase in our distance from the Sun is virtually negligible compared with that from the Moon. The annual increase in the Earth–Moon distance is about four centimetres.

Walter Munk, US citizen. Born in 1917 in Vienna, Austria. PhD in oceanography in 1947 and Professor of Geophysics in 1954, both at Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA, USA. Cofounder (in 1959) and director (1959–82) of the Cecil H. and Ida M. Green Institute of Geophysics and Planetary Physics (IGPP).

***Scripps**: http://sio.ucsd.edu/Profile/wmunk*
***IGPP**: www.igpp.ucsd.edu/people/detail.php?name=Munk_Walter*

Prize amount: SEK 4 million.
Prize-awarding ceremony to be held at the Royal Swedish Academy of Sciences (RSAS) on 11 May 2010, in the presence of Their Majesties the King and Queen of Sweden.
The Crafoord Days 2010:
Stockholm (RSAS): Prize Symposium in Geosciences on 10 May and Prize-awarding ceremony on 11 May.
Lund ("Geocentrum II"): Prize Lecture on 12 May.
More information: http://kva.se and www.crafoordprize.se
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The Royal Swedish Academy of Sciences, founded in 1739, is an independent organization whose overall objective is to promote the sciences and strengthen their influence in society. The Academy takes special responsibility for the natural sciences and mathematics, but endeavours to promote the exchange of ideas between various disciplines.