

IN MEMORIAM



Arne M. Bratseth, 1949–2004

Arne Matias Bratseth, Professor in meteorology at the University of Oslo, died 2 February 2004 after a short period of illness, only 54 years old. With his death, international dynamic meteorology has lost a brilliant scientist.

Bratseth's career started when as a student at the Department of Geophysics, University of Oslo he became assistant to Professor Arnt Eliassen. Except for a short period in the Research Department at the Norwegian Meteorological Institute in 1981–82, Bratseth worked at the Department of Geophysics (now Department of Geosciences). He became associate professor in 1983 and full professor in 1989. During 6 months in the autumn of 1995 he visited Professor Brian Hoskins' group at the University of Reading, UK.

Bratseth was an independent scientist who produced relatively few, but original and significant, papers. He had a profound understanding of the atmospheric sciences and in geophysical fluid dynamics.

Bratseth invented new methods that were central in the operational system for short-range limited-area NWP at the Norwegian Meteorological Institute in the early 1980s (NORLAM). He generalized the time-staggered Eliassen grid to a more accurate and faster method than other similar schemes. He designed a method for dynamic initialization combined with operator splitting that gave similar results as non-linear normal mode initialization, but without the need for explicit calculations of modes. He also developed a method for objective analysis using successive correction with weights that produced results asymptotically equivalent to optimal interpolation. All these methods combined innovation with deep meteorological insight, and yielded high quality operational results at low computational costs. NORLAM has also been used in research on mesoscale weather phenomena such as flow over mountains and polar lows, resulting in numerous publications.

During the later 10–15 years, Bratseth's research interest became the understanding of the atmosphere's general circulation. He gave remarkable contributions in 3 papers that deserve considerable attention (Bratseth (1998), *Tellus* **50A**, 451–467; Bratseth (2001), *J. Atmos. Sci.*, **58**, 3328–3339; Bratseth (2003), *Q. J. R. Meteorol. Soc.*, **129**, 2331–2346). In particular he designed a robust method to calculate time-averaged meridional winds and diffusivities, which accounted for larger portions of the mass transport than other methods (e.g. the transformed Eulerian means). Furthermore, it provided a consistent conceptualization of the maintenance of the mid-latitude jet currents. Zonal acceleration has a minimum in the middle of jets despite a maximum in the eddy kinetic energy.

Baroclinic waves need to break in order to produce significant zonal acceleration, and he showed this to occur on the pole-ward side of the jets by occlusion and on the equator-ward side by cut-off lows.

Arne Bratseth was much appreciated as a teacher and lecturer because of his extraordinary ability to explain complex physical relations in a simple way; an ability which also influenced his research. He was a colleague who most willingly shared his deep wisdom and insight. His premature death is a great loss for Norwegian traditions in dynamical meteorology. Due to a modest personality his scientific achievements were not as widely recognized as they deserved, and we strongly recommend scientists to read and appreciate his published work.

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