



Lenticular clouds form over the Crown Range in New Zealand as strong winds are forced over the mountain range. A team meeting of the SPARC Gravity Wave Activity discussed parametrisation of drag created in such conditions in models, and how to improve observations and modelling of orographic wave drag (see report on page 31).

Photo credit: Katja Riedel Photography

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The International Union of Geodesy and Geophysics (IUGG) held its 27th General Assembly from 9 to 17 July 2019 in Montréal, Canada, attended by just under 4000 participants from all continents. The event also marked IUGG's centennial, the Union having been founded in July 1919 in Brussels when structures of international scientific cooperation were re-established after World War I.

David Grimes, head of the Meteorological Service of Canada and past-president of WMO (2011-19), delivered the prestigious IUGG Union lecture. He claimed that Earth sciences provided underlying pillars to meet future societal challenges and underscored the proven complementary roles of WMO and IUGG as inter-governmental and non-governmental partners in advancing applicable knowledge in the various geophysical compartments, atmosphere and oceans in particular.

In the celebratory IAMAS symposium M25, **James R. Fleming** put a century of atmospheric research challenges and accomplishments into a historical perspective, with special foci on the periods after the first and the second world-war, respectively, and three inter-linked generations of influential researchers (cf. Fleming, 2016), while **John P. Burrows** recalled the increase of satellite observations addressing the temporal development of atmospheric chemistry and global pollution in the Anthropocene, a new geological epoch, currently under consideration.

In the Union symposium “Centennial of the international cooperation in Earth and space sciences”, **Huw**

C. Davies provided a fast and tightly packed ride through decades of dynamical meteorology under the modest sounding title “A flavour of IAMAS-related achievements” and underscored the decisive role of small research groups for past breakthroughs. Figure 17 assembles the four exemplary speakers as they appeared at IUGG-2019.

Several colleagues, who are active in SPARC, participated in a number of IAMAS-symposia, e.g. M06 – “Middle atmosphere science”, M07 – “Stratosphere couplings to the troposphere and the ocean”, M08 – “Air quality in the changing Anthropocene”, M11 – “Advances in atmospheric dynamics”, M15 – “Frontier challenges in data assimilation and ensemble forecasting”, M20 – “El Niño-Southern Oscillation and its regional and global impacts”, and M21 – “Celebrating the Montreal Protocol in Montreal” (for details cf. IUGG, 2019). M15 contained a commemorative session about the achievements of William Lahoz (1960-2019) and, rather spontaneously, a dinner of William's colleagues and his close family.

From four bids for hosting the next general assembly, the IUGG council selected Berlin, Germany. IUGG-2023 will take place during the second half of July in the City-Cube conference centre.

Fleming, J.R., 2016: *Atmospheric Science: Bjerknes, Rossby, Wexler, and the Foundations of Modern Meteorology*. 306 pp. MIT Press, Cambridge, MA, ISBN 978-0-262-03394-7.

IUGG, 2019: Final program, 486 pp., online <http://iugg2019montreal.com/assets/iugg2019-final-full-program.pdf>.

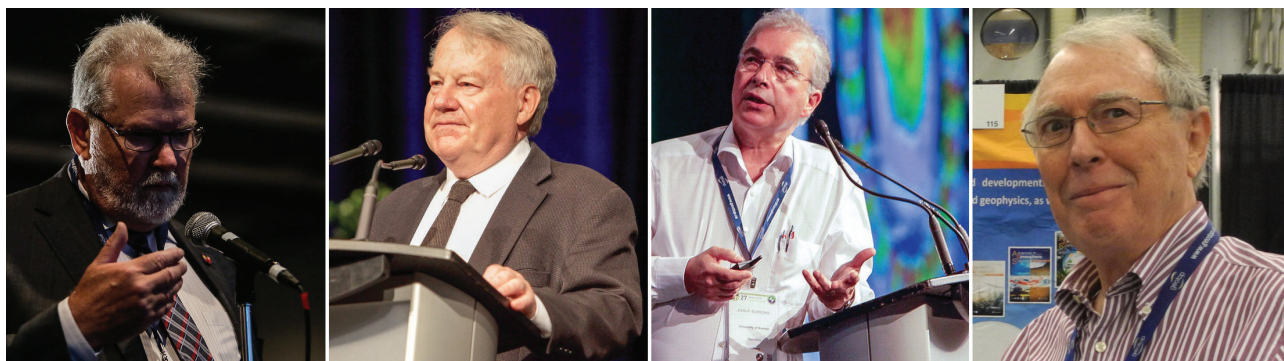


Figure 17: Advocating non-governmental research efforts for WMO and SPARC (from left): David Grimes (Canada; WMO president 2011-19), James R. Fleming (USA; atmospheric physicist and historian of science), John P. Burrows (Germany; principal investigator of Envisat; photos: IUGG-2019), Huw C. Davies (Switzerland; long-term contributor to and reviewer of atmospheric dynamics; photo: Hans Volkert).