



**Switzerland**

Institute of Electrical and Electronics Engineers



Institut für Geodäsie und  
Photogrammetrie



Invitation to an AES-IEEE-CH Joint Lecture on

## Nano-Satellites – a GNSS Payload for Orbit Determination and Timing

Prof. Markus Rothacher, IGP ETH Zürich

**Datum:** 15. January 2020  
**Zeit:** 17.30 Uhr  
**Ort:** ETH Zürich, HG D1.1



--- Markus Rothacher is professor of Mathematical and Physical Geodesy at ETH Zurich. He got his diploma and PhD in Astronomy from the University of Berne. He worked at TU Munich and the Deutsches GeoForschungsZentrum (GFZ) in Potsdam, where he was responsible for the satellite missions CHAMP and GRACE. His research interests comprise high-precision GNSS applications, space geodesy, satellite missions, orbit determination, and Earth's rotation. For many years he was Chair of the Global Geodetic Observing System (GGOS) and Analysis Coordinator of the IERS. In 2018 he received the Vening Meinesz Medal. Presently, he serves as the Chair of the Galileo Science Advisory Committee (GSAC) of ESA ---

--- In the last years, there has been an enormous increase in the number of nano satellites launched into space and constellations of thousands of such satellites is foreseen in the near future. At ETH Zurich, together with Swiss partners, we developed a very small, low-power multi-GNSS payload capable of precise orbit determination and timing onboard even the smallest satellites. On December 3, 2018, and April 1, 2019, the first two 3-unit cube satellites of the Swiss company Astrocaster carrying our GNSS payload were launched. We will demonstrate the accuracy of the orbit determination and timing performed in real-time onboard the two satellites using GPS as well as Galileo. A first validation of the orbit accuracy we can reach has already been achieved by shooting with laser pulses from the Zimmerwald observatory to the tiny retro-reflectors mounted on both satellites. ---

**We look forward to your participation. Guests are welcome.**

Heinz Wipf, Chair AES IEEE.CH

Dr. Urs Wild President ION-CH