Open Seminar Series
Geoscience & Remote Sensing

SEntinel-1 SAR Companion Multistatic Explorer (SESAME): an Earth Explorer 9 mission proposal

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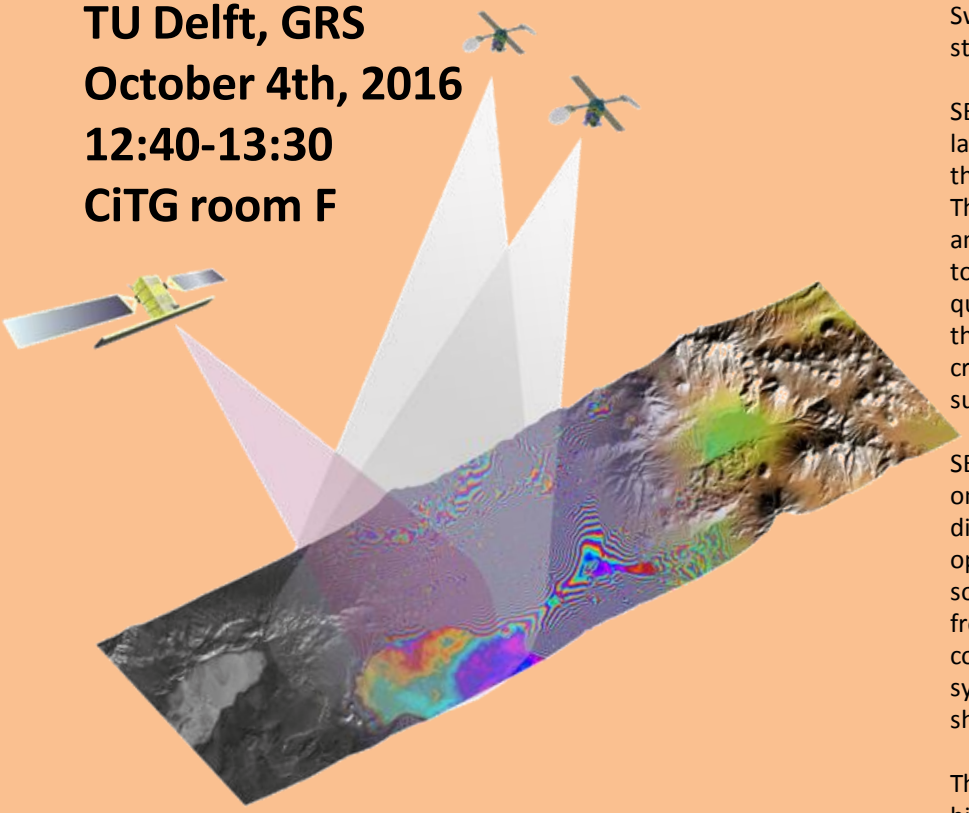
12:40-13:30
CiTG room F



Europe's main instrument to implement novel Earth Observation (EO) missions is ESA's Earth Explorer Program. Four Earth Explorer mission have been flown so far (GOCE, SMOS, CryoSat and Swarm), while four other (Aeolus, EarthCARE, BIOMASS and FLEX) are at different implementation stages. In 2015, ESA issued the Earth Explorer 9 call for proposals.

SESAME is a proposal prepared in response to this call. SESAME is dedicated to the observation of land surface topography, topographic change and bio-geophysical parameters in order to advance the scientific understanding and modelling of dynamic processes of the geosphere and biosphere. The observations focus at processes that are associated with distinct temporal changes of shape and elevation of land surfaces and ice bodies, as well as forest height and biomass. Available topographic databases with (near) global coverage are lacking the capability to capture and quantify key features as required for studying dynamic processes that are shaping and transforming the land surfaces, ice bodies and vegetation cover. The SESAME mission will be able to fill this critical gap by providing repeat acquisitions of precise, spatially-detailed elevation data over land surfaces including ice covered areas and forests.

SESAME´s system concept is to build a single-pass cross-track SAR interferometer using two receive-only C-band radar satellites flying in close formation relative to each other, and at an along-track distance of roughly 200 km with respect to Sentinel-1C or D, which will be used as a transmitter of opportunity. The dual spacecraft solution is seen as the most efficient and technically feasible solution to build an interferometric companion to Sentinel-1. The geometric diversity resulting from the proposed configuration allows the retrieval also of the North-South deformation component with high accuracy by means of DInSAR, a feature that is not provided by any other SAR system. Moreover, it will provide, for the first time, systematic bistatic SAR acquisitions, which should open the field for new radar remote sensing research.

This seminar will provide an overview of the proposed mission concept, indicating some mission highlights and presenting expected mission performances.