

# Science IV: Altimetry for Cryosphere and Hydrology

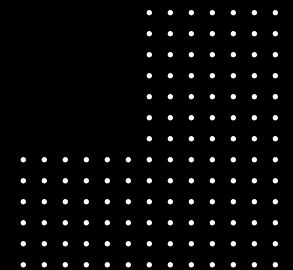
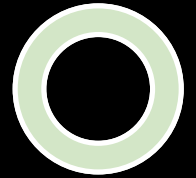
## Summary

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# Highlights from the session

- Nice session and fruitful discussion **with 6 oral presentations** (plus 1 cancellation) **6 posters** and **3 “forum only”** contributions.
- Posters were focused on data product status and activity related to current (CryoSat, S3) and future missions (CRISTAL) . More diverse science domains were present in the oral and forum.
- This OST saw far fewer contributions compared to other years (50-60 abstracts) where it has been challenging to accommodate time for both Hydrology and Cryosphere presentations in a single session. Should we have separate sessions in the future?
- **Nevertheless, there were very interesting presentations and discussions with new exiting results** addressing a large spectrum of domains...



# Highlights from Oral Presentations



- **Measuring longitudinal river profiles from Sentinel-6 Fully-Focused SAR mode. (Boy et al)**
  - Powerful technique which opens new perspective in the observation and understanding of longitudinal river profile evolution in time and space
  - Even if much more challenging, extending the approach to S-3 and/or Sea Ice could be envisaged
- **The S3NG-TOPO Mission; Enhancing Continuity, Performance and Hydrology Capabilities (Egido et al)**
  - Hydrology has been recognized as a primary mission objective of S3-NGT, introducing a new set of stringent requirements to the mission.
  - Swath instrument will include specialized HR mode designed for hydrology applications, allowing measurement for rivers wider than 100m and the monitoring of lakes and reservoirs with areas above 250m x 250m.
- **Improving the retrieval of lake ice thickness with radar altimetry data (Magili et al)**
  - Novel and promising “double peak” retracking approach for the estimation of Lake Ice Thickness (LIT) by using LRM and SAR Ku-band radar altimetry data on both unfocused and fully-focused modes.
  - Paves the way towards regular and robust LIT monitoring with current and future LRM and SAR altimetry missions (including CRISTAL).

# Highlights from Presentations



- **CRISTALair, the CRISTAL Airborne Demonstrator (Garcia-Mondejar et al)**
  - Development of CRISTAL is crucially dependent on dedicated campaigns that will provide the essential data algorithm development and validation.
  - The main advancement in CRISTALair lies in its ability to acquire data simultaneously in Ku- and Ka-band, elevating the Science Readiness Level (SRL) of dual-band algorithms/processings of CRISTAL.
- **Sentinel-3 thematic products: latest results based on full mission reprocessing validation (Catapano et al.)**
  - The ESA level-2 Sentinel-3 STM Altimetry processor has been updated to generate three thematic products optimized for Inland waters (HY), Sea Ice (SI), and Land Ice (LI) with associated FMR.
  - A highlight of the validation results has been presented in this study and show that the evolution introduced in the processing algorithm led to very significant improvement over all surfaces.
- **Capitalizing on the experience of iceberg study from classical, SAR and interferometric altimeter for the CRISTAL mission (Tournadre et al. )**
  - Algorithms have been developed to detect and analyze the iceberg's characteristics under hypothesis on the ice backscatter and iceberg freeboard.
  - Specific SARIn swath processing of Cryosat-2 passes show that swath processing can be used to estimate icebergs characteristics within open sea as well as within sea ice