The First SWOT Science Definition Team Meeting

- **Held on Jan 28-30 at Caltech in Pasadena**
- **All 38 PI teams participated with over 70 attendees including the joint NASA CNES mission team.**
- **Meeting Objectives:**
  - **Review the status of the program and mission development**
  - **Review the science goals and requirements.**
  - **Facilitate the interaction among the SDT members.**
  - **Identify the issues of mission development that require SDT's recommendations.**
  - **Facilitate the interaction between the SDT and the mission team.**
  - **Formulate near-term action items.**
- **Oceanography and hydrology splinter meetings were conducted to discuss the near-term issues in mission development.**
  - **Orbit selection**
  - **Non-ping-pong mode of KaRIN operation**
  - **High-resolution data coverage**
  - **Wet tropospheric correction over the ocean**
  - **Ground-track repeatability**
  - **Synergistic Sciences**
  - **Algorithm development**
- **The development of AirSWOT was presented with plans for measurement experiments**
- **SDT Working Groups were identified to address the near-term mission development issues.**
- **Next SDT meeting, June 17-19, CNES Hq, Paris**
  - **Results from the working groups will be the key agenda items**

SDT Working Groups

- **High-resolution data coverage (Yi Chao, Sylvain Biancamaria)**
  - What are the rationales for requiring high-resolution data for coastal studies, from estuaries to off-shore open oceans?
  - Create a table where each row informs how much data downlinking capacity is needed for a particular geographic target (e.g., islands, Greenland hydrology, sea ice, etc.) with multiple rows representing differing seasons.

- **Orbit selection (Richard Ray, Pierre-Yves Le Traon)**
  - Daily adjacent sampling (MCR orbit) vs alternative orbits in terms of pros and cons in sampling the key phenomena driving the mission's instrument requirements
  - Tidal aliasing considerations for the candidate orbits

- **Wet-tropospheric correction (Brown, Obligis)**
  - The impact of the wet tropospheric correction over the ocean; can the baseline design meet the requirement? If not, what is the strategy for reaching an optimal approach given the project resources?
  - What is the approach to the correction over land?
  - What is the approach to addressing the fine-scale variability near the coast?

SDT Working Groups (cont'd)

- **Ocean and hydrology simulator utilization (Bertran Chapron, Kostantinos Andreadis)**
  - Coordinate the interaction between the users and the Project on the requirement for the simulator products.
  - Investigate the utility of using alternative models for simulation.
  - Demonstrate to the SDT at large on the utility of the simulator products

- **Ground track repeatability (Steve Nerem)**
  - What is the impact of relaxing +/- 1 km repeat requirement on building SSH time series from KARIN as well as from the nadir altimeter?
  - What is the proposed new requirement?

- **Discharge algorithms and AirSWOT (Mike Durand, Helene Roux)**
  - By the end of Phase A, determine possible required spatial resolutions, height accuracies, and temporal sampling periodicities necessary to estimate discharge. Ideally, these would be demonstrated with AirSWOT measurements and validated with in-situ experiments.
  - Create several X-Y plots showing the relationships of discharge accuracy (1) to height accuracies, (2) to spatial resolutions and (3) to temporal sampling.
  - Determine how to validate or characterize SWOT discharge.

SDT Working Groups (cont'd)

- **Hydrologic science questions and related measurement requirements (Larry Smith, Aaron Boone)**
  - By the end of Phase A, succinctly state the global science questions that drive SWOT and tie these to the measurement requirements. This tie-in needs to be stated in a way such that changes in height accuracies, or in spatial resolutions, or in temporal sampling can be directly tied to our ability to answer a specific science question.
  - Create a series of X-Y plots that show our ability to answer a science question plotted against a SWOT measurement requirement (e.g., against the spatial resolution, the height accuracy, or the temporal sampling, see Biancamaria et al. for global storage change plot).

- **Data products and mission interactions (Faisal Hossain, Sophie Ricci)**
  - During and after Phase A, identify data structures that can downsize the massive SWOT high-resolution data volume and identify a method that allows easy and understandable access to SWOT data.
  - Noting that SWOT measures one aspect of the water cycle, create interactions with other satellite missions, projects, field experiments, etc. who are measuring other parts of the water cycle, thus facilitating an improved understanding of water volumes and fluxes, globally.