



## **COORDINATION OF INTERNATIONAL SPACEBORNE SAR MISSIONS**

### **Working Group 2 – Future SAR Systems**

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*International SAR Coordination Workshop*

*ESA/ESRIN*

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## 2018 Recommendation 3: Take an optimized systems approach to the overall constellation of planned and proposed missions to explore the possible mutual benefit of the total constellation coverage and capabilities.

- Each organization, *understandably*, optimizes its system for its needs within its limitations. By evaluating the global constellation of missions as a coordinated system, there are opportunities for enhanced or new capabilities, while meeting individual agency requirements. Some examples:
  - Better filling of gaps and higher repeat coverage by slight adjustment of orbit, node crossings or local crossing time.
  - Quick response for time critical applications.
  - Better continuity of observations over a long period of time (multi decadal).
  - Enable new multiple system capabilities such as bistatic observations and multi-interferometric observations.
  - Left / right imaging coordination to overcome shadowing



# 2018-2022 Activities

- Martin Suess, Manfred Zink, Paul Rosen Working Group Co-chairs
- Working group members from ESA, DLR, JAXA, CSA, NASA, ASI, CONAE
- Regular working group meetings
  - Strategy for coordination
  - Surveys of missions and plans
  - Discussions on status of missions in planning to look for coordination opportunities
- Supported LPS'19, IGARSS'21, LPS'22, IGARSS'22

# WG -2 : Future imaging systems - Goals, plans, challenges and opportunities

- Workplan:
  - Identify a set of global science measurements of interest to many/most countries with space agencies, which can be addressed by SAR (possibilities depicted at right)
  - Consider specific inter Agency coordination scenarios
    - *e.g.* multi-lateral partnerships, federations, CEOS/GEO-centric initiatives
    - Identify potential opportunities and roadblocks
    - Factor in the role commercial SAR



# WG -2 : Table of Missions

	A	B	C	D	E	F	G	H	I	
1	mission	agency	mission status	frequency	polarization	swath width [km]	resolution (Level-1) rg x az [m]	orbit repeat of constellation [days]	max orbit duty cycle [min]	co
2	Sentinel-1 A-D	EC/ESA	flying	C-Band	single, dual	250	5 x 20	6	25	
3	BIOMASS (Earth Explorer)	ESA	approved	P-Band	full pol	150	60 x 8 (single look) 60 x 50 (6-look product)	drifting	50	global
4	ROSE-L	EC/ESA	approved	L-Band	dual pol, full pol	260	50 m <sup>2</sup> , 100m <sup>2</sup>	6		
5	Harmony (Earth Explorer)	ESA	approved	C-Band	single, dual	250	5 x 20	6		
6	Sentinel-1 NG	EC/ESA	planned	C-Band	single, dual, quad	400	25 m <sup>2</sup>	6	50	
7	NISAR	NASA/ISRO	approved	L-band / S-Band	single, dual, quad	240	(1.9, 3.8, 7.5, 30) m rg x 7 m az	12	> 50 L-band > 10 S-Band	
8	Decadal Survey mission	NASA	planned	TBD - Likely NISAR	TBD - Likely NISAR	TBD - Considering NISAR-like, constellations of smaller swath	TBD - Likely similar to	TBD - Considering NISAR-like, and variable constellations	TBD - Considering	



## What we're trying to accomplish in the splinter

- Reach a common understanding of coordination in the space segment
- Survey the landscape of missions that have coordinated successfully
- Examine the parameters that promote and thwart coordination
- Begin a SWOT analysis for coordination
- Invent a future coordination scenario that seems feasible

# Mural invitation

- Some of the WG2 splinter will be interactive on the internet using a tool call mural (app.mural.co).
- If you want to participate, and are not already registered for WG2, please email us ([parosen@jpl.nasa.gov](mailto:parosen@jpl.nasa.gov), [martin.suess@esa.int](mailto:martin.suess@esa.int), [Manfred.zink@dlr.de](mailto:Manfred.zink@dlr.de))
- You will need to set up a mural account with that email address.
- The interactive mural for WG2 is at:
- <https://app.mural.co/invitation/mural/sdc5275/1663965751007?sender=u5115bca1f7d13fb77d990234&key=4bffca82-3da8-4e1f-bad6-142b4539d62a>



# WG2 Mural Event

The screenshot displays a MURAL collaborative workspace titled "WG2 Mural". The interface includes a browser address bar with the URL <https://app.mural.co/j/sdc5275/m/sdc5275/1663965751007/875d8d4524ea8f89146dad208415fdcc7c8fad697?sender=us11bca1f7d13fb77d990234>. The workspace contains five cards:

- Card 1: Where In The World** - Features a world map and a color-coded legend with arrows pointing to various regions.
- Card 2: What does coordination in space systems mean to you?** - Includes a brain icon and several rows of colored sticky notes (yellow, blue, cyan, purple, pink, red, light blue, green).
- Card 3: What are examples of successful space radar coordination?** - Includes a wine glass icon and several rows of colored sticky notes.
- Card 4: What do you consider technical obstacles to successful space-segment coordination?** - Includes a person running icon and several rows of colored sticky notes.
- Card 5: WG2 Splinter Outcomes** - Includes a trophy icon and several rows of colored sticky notes.

The right sidebar contains an "Outline" section with five items:

- 1 Where In The World ...**: This is an exercise to familiarize yourself with Mural tools.
- 2 WG Splinter Outcomes**: Simply type in your name (or alias if you want to be anonymous) and have fun!
- 3 Meaning of Coordina...**: Simply select a post-it note and write in what technical coordination means to you.
- 4 Examples of coordin...**: Simply select a post-it note and write in examples of successful coordination.
- 5 Coordination Obstac...**: Simply select a post-it note and write your thoughts on technical obstacles to coordination of the...

At the bottom center, there are navigation icons for "PR" and a plus sign. At the bottom right, there is a zoom control set to 12% and a "Navigation Settings" button.