



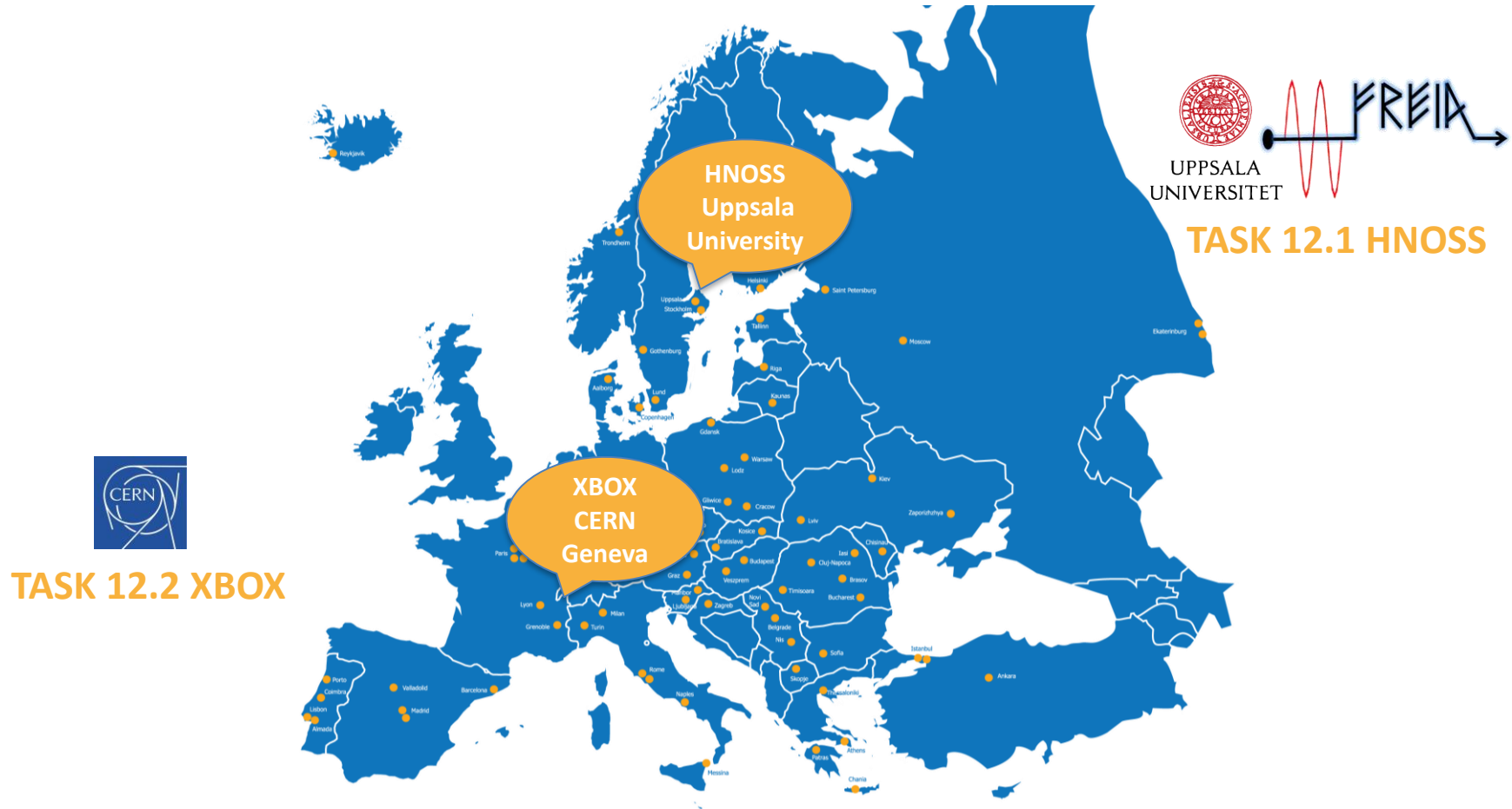
# Testing of Advanced RF Structures TNA WP12 RF Test Stands

4<sup>th</sup> Annual Meeting, 21 April 2021

Roger Ruber (Uppsala University)

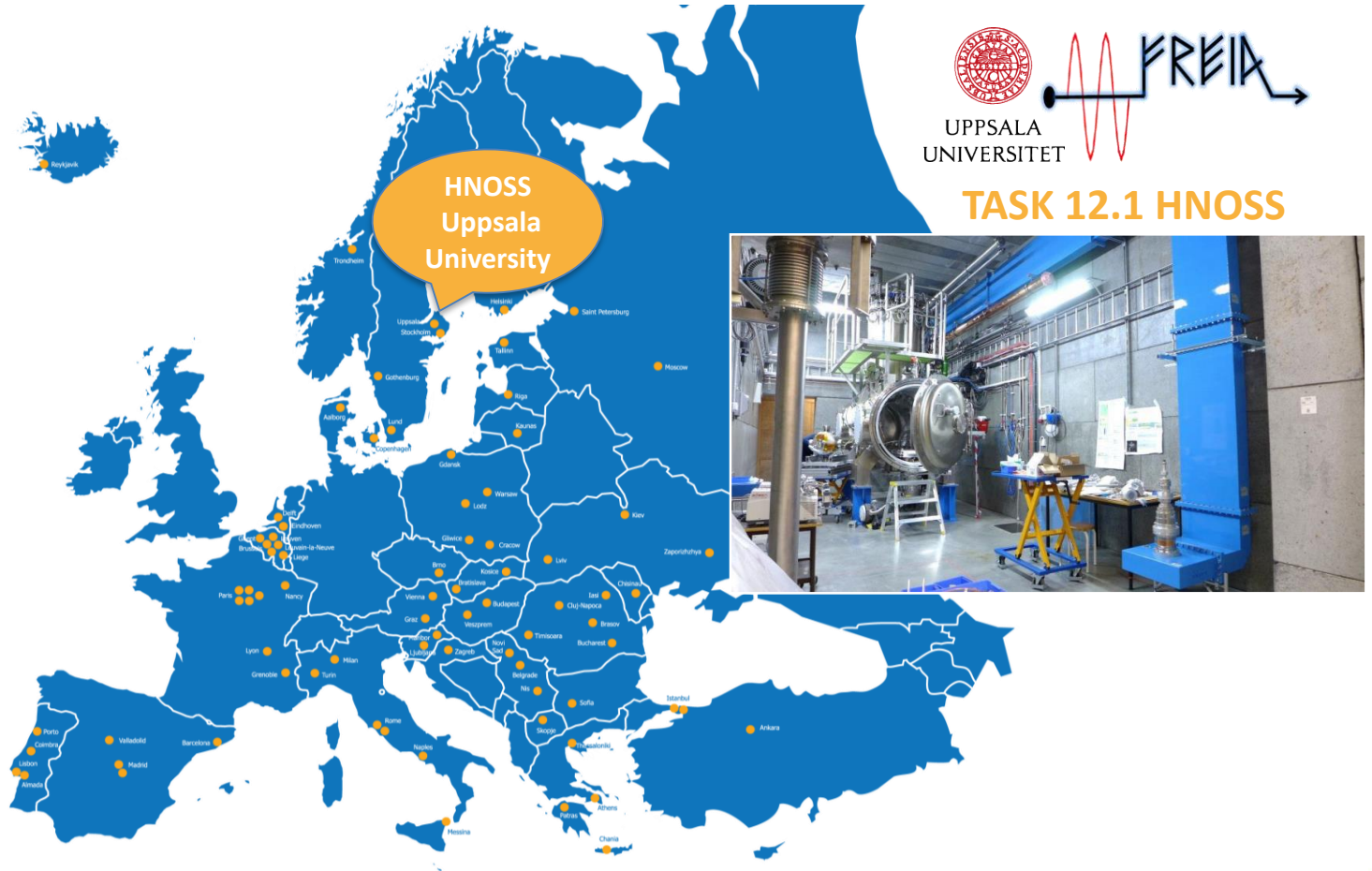
Walter Wuensch (CERN)

# WP12 RF Testing Facilities



The TNA within WP12 groups **TWO** facilities devoted to testing of superconducting RF cavities and normal conducting RF cavities.

# WP12.1 UU/FREIA HNOSS Facility



The **HNOSS** facility at the FREIA Laboratory, Uppsala University, Sweden, is available for testing of superconducting RF cavities with integrated helium tank.

# WP12.1 UU/FREIA HNOSS - Overview

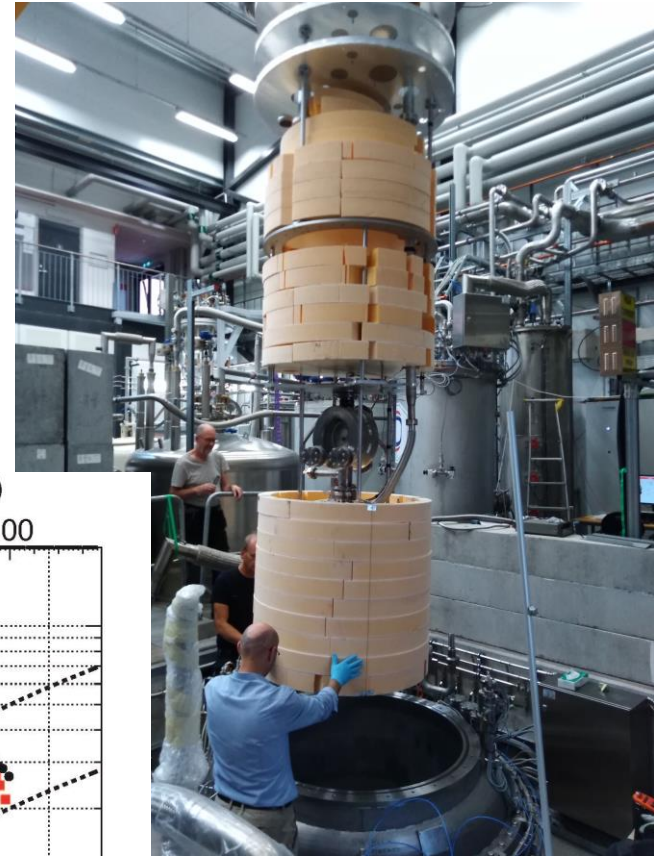
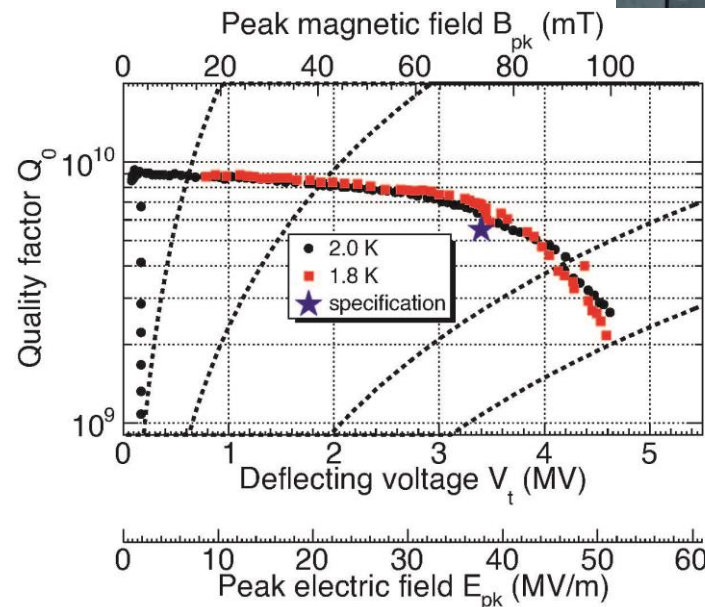
In proposal - 4 projects with a total of ~~2880~~ 3790 access units.

#	Name	Institutes	Status	Access Units	Users
1	ESS High-beta Elliptical Cavity	CEA Saclay	Completed. Reported and published.	1330	18
2	Validation of a prototype double spoke cavity cryomodule	IPN Orsay	Completed. Reported and published.	2048	14
3	RF and piezo actuators study on spoke cavities	Lodz University of Technology	Completed. Reported and published.	36	8
4	HL-LHC crab cavity cold testing	CERN	Completed phase 1. Report published.	480	7
<b>TOTAL Achieved Today</b>				<b>3894 (103%)</b>	<b>47</b>



# WP12.1 FREIA-HNOSS-2020-01 (#4)

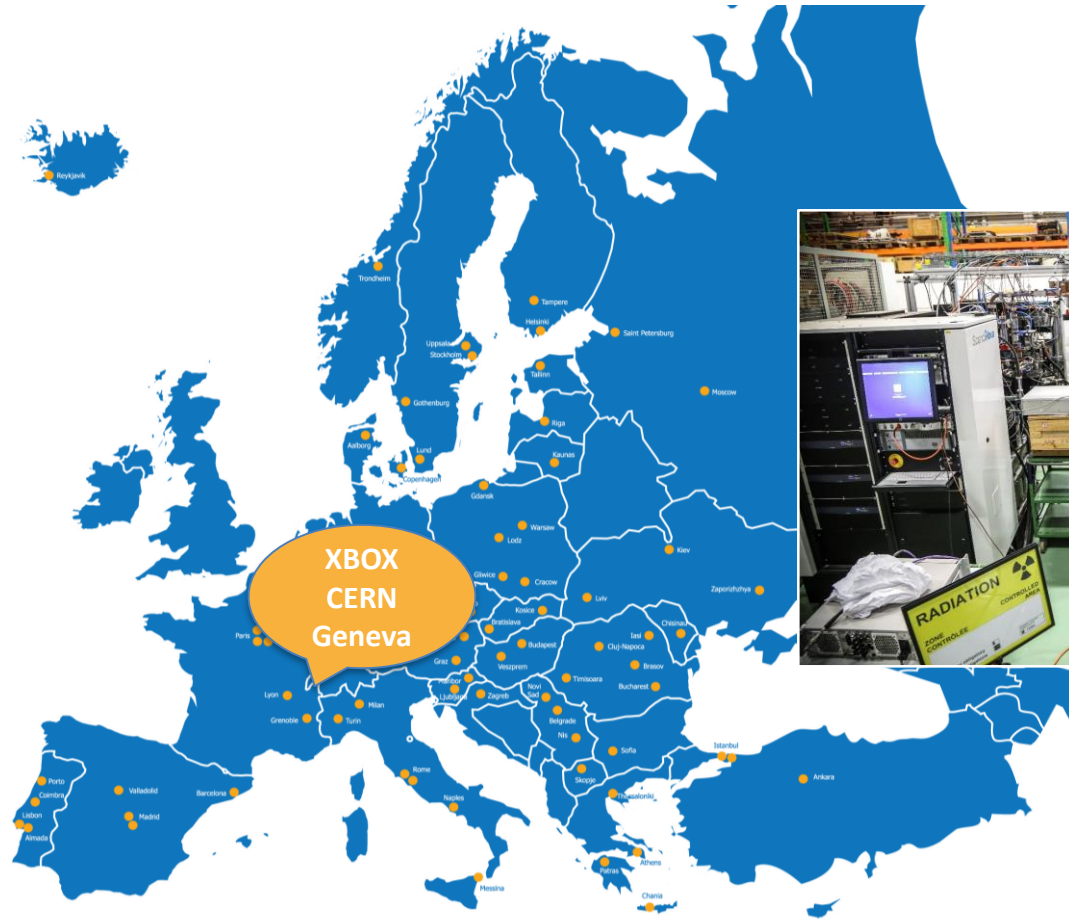
- Validation of prototype crab cavity for HL-LHC
- Tested September – October 2020
  - vacuum leak after installation in cryostat:
    - probable leak in vacuum valve, with possible pollution of the cavity
  - test results not as good as expected
- Cavity shipped back to CERN
  - cleaned, awaiting return to FREIA for 2<sup>nd</sup> test
- Report published
  - [arXiv:2011.05210](https://arxiv.org/abs/2011.05210)



# WP12.2 CERN XBox Facility



## TASK 12.2 XBOX



The **XBox** facility at CERN, Switzerland, is available for testing of normal conducting RF cavities/structures at X-band frequency.

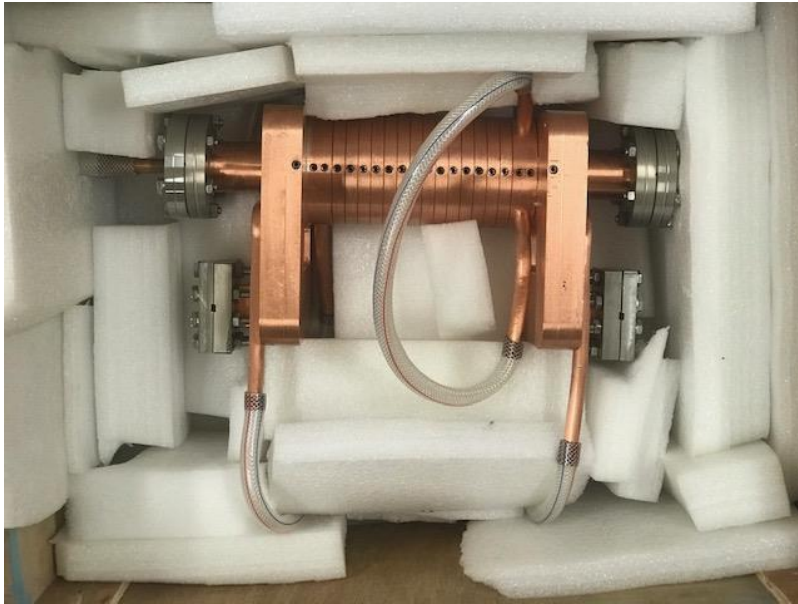
# WP12.2 CERN XBox - Overview

In proposal - 4 projects with a total of ~~6000~~ 7500 access units.

#	Name	Institutes	Status	Access Units	Users
1	Dark current and breakdown Spectrometer	Uppsala University	Completed. Reported and published	1680	6
2	X-band pulse compression chain	PSI and Tsinghua University	Completed. Reported and published, PRAB.	4000	7
3	X-band RF deflecting structure testing	Lancaster University and SARI (Shanghai)	Preparation. Expected start mid-May	(3000)	(6)
4	Measurement of the Average Power limitation for High Gradient X-band Accelerating Structures for Future Light Sources	Technical University of Eindhoven	Approved. Installation after start-up previous project.	(500)	(5)
<b>TOTAL Achieved Today</b>				<b>5680 (76%)</b>	<b>13</b>



# WP12.2 CERN-XBOX-2019-01 (#3)



SARI (Shanghai) deflector cavity



Lancaster deflector (crab) cavity

## Project 3 X-band RF deflecting structure testing



# WP12 TNA - Outlook

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- A typical User Project is quite complex, often requires some form of approval at the level of the proposing institutes, so lead times are long.
- Hnoss project 4 continues.
- Xbox projects 3 starting and project 4 to follow soon after.
- We expect that  
**WP12 will fulfill project and access unit requirements.**