



# Progress Report e-Callisto network

- Solar Radio Burst Observation
- Education and Training
- Radio Monitoring

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ETH Zürich  
Switzerland

ISWI-meeting Vienna, 01.02.2017



# New station Denmark



Kristoffer Leer, National Space Institute, Lyngby, Denmark

# New station Austria

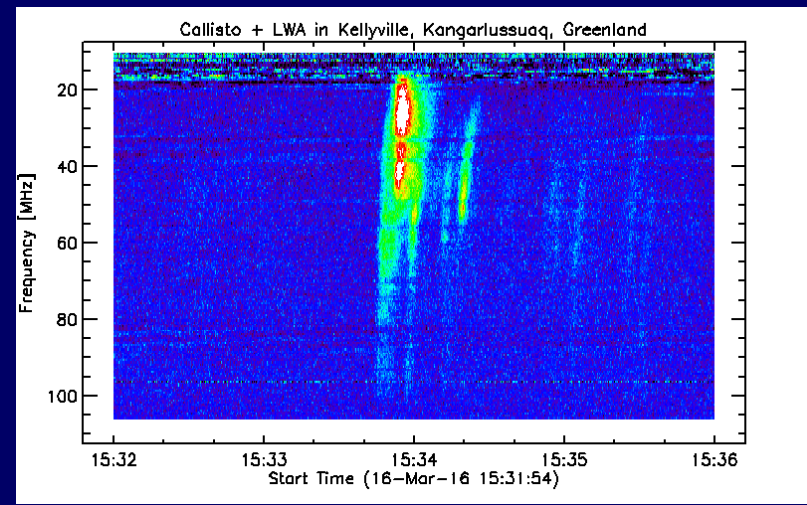
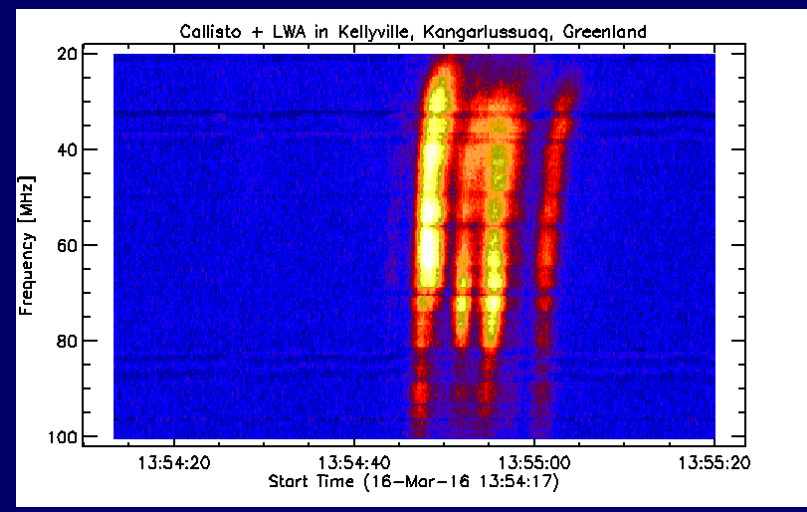


Fritz Lensch, Puplic Observatory ANTARES, 3074 Michelbach, Austria

# New station Greenland



Long Wavelength Antenna (LWA)  
Kangarlussuaq, Greenland

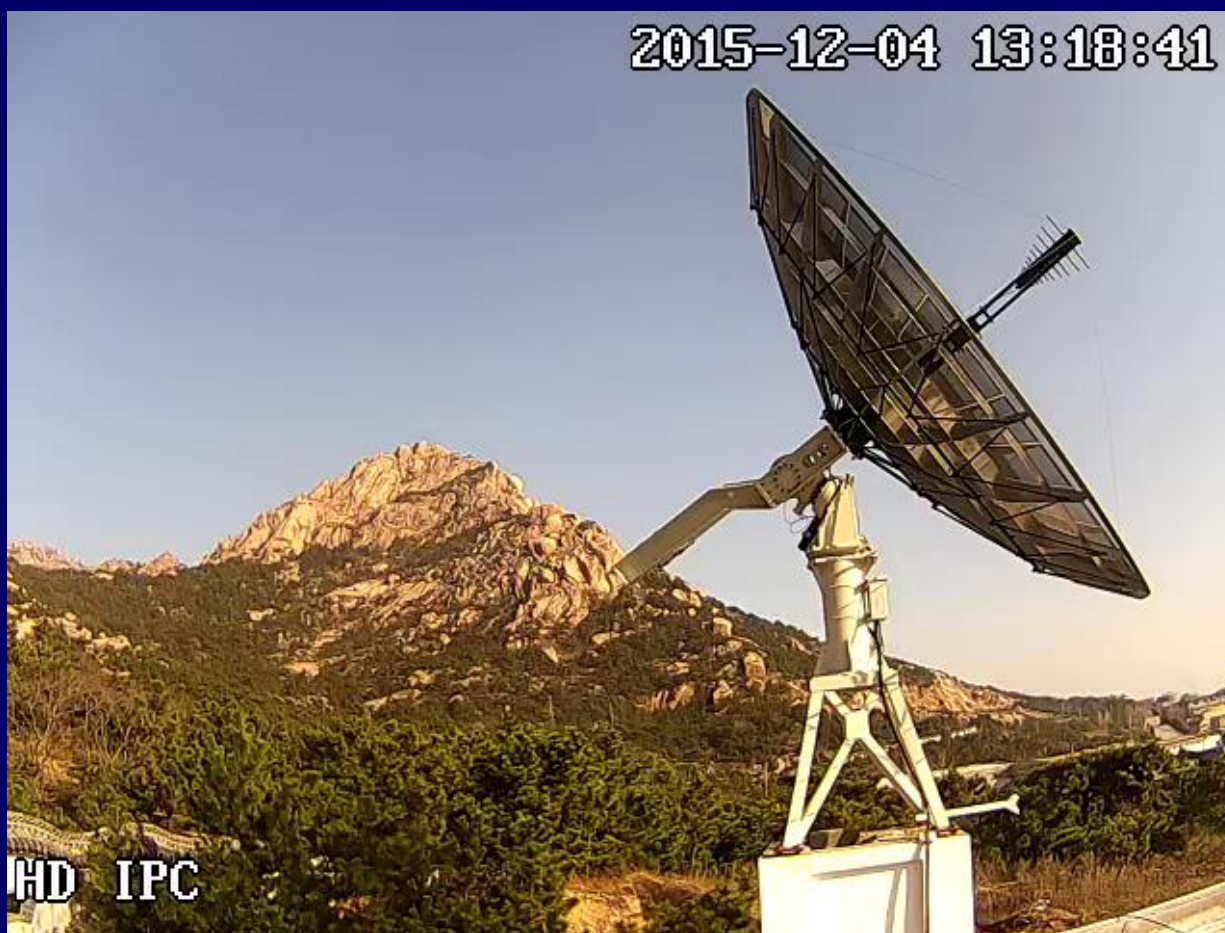


# New station Tomohohn North Sulawesi, Indonesia



Timbul Manik, Space Science Center,  
National Institute of Aeronautics and Space (LAPAN) Bandung, Indonesia

# New station China



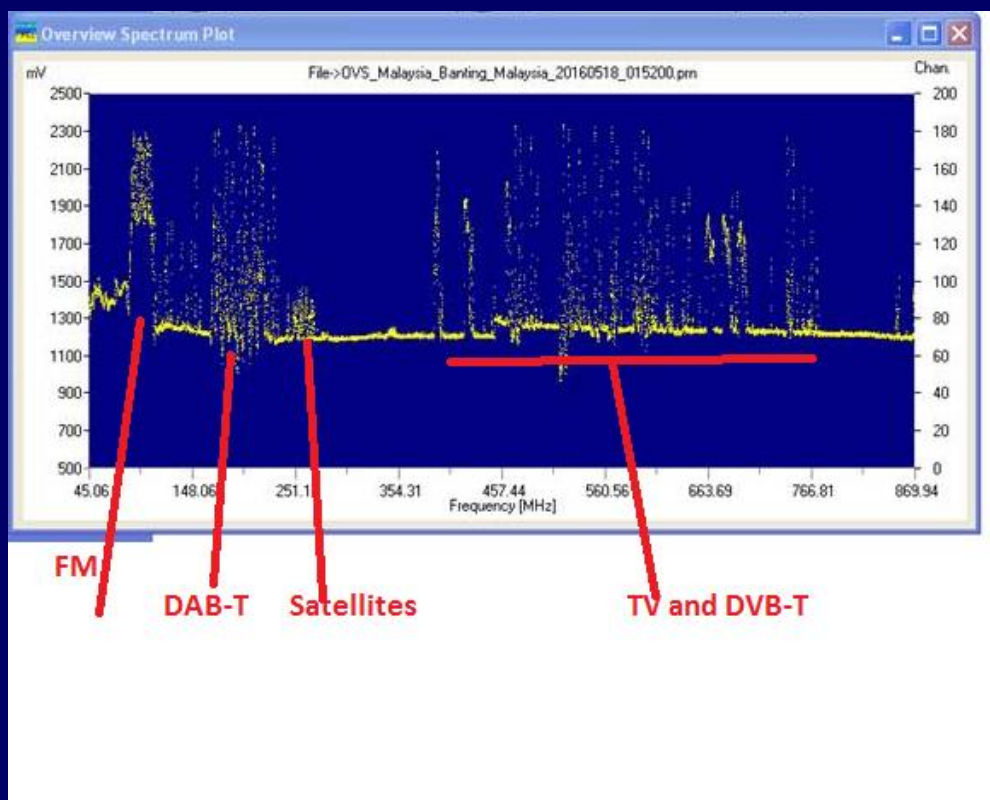
Shiwei Feng, Chashan observational station, China

# New station Bulgaria



Kamen Kozarev,  
Rhozen observatory  
Bulgaria

# New station Malaysia



Asnor Nadirah Ishak, National Space Agency of Malaysia (ANGKASA)  
Ministry Science, Technology and Innovation (MOSTI)



# New station Gandhinagar, India



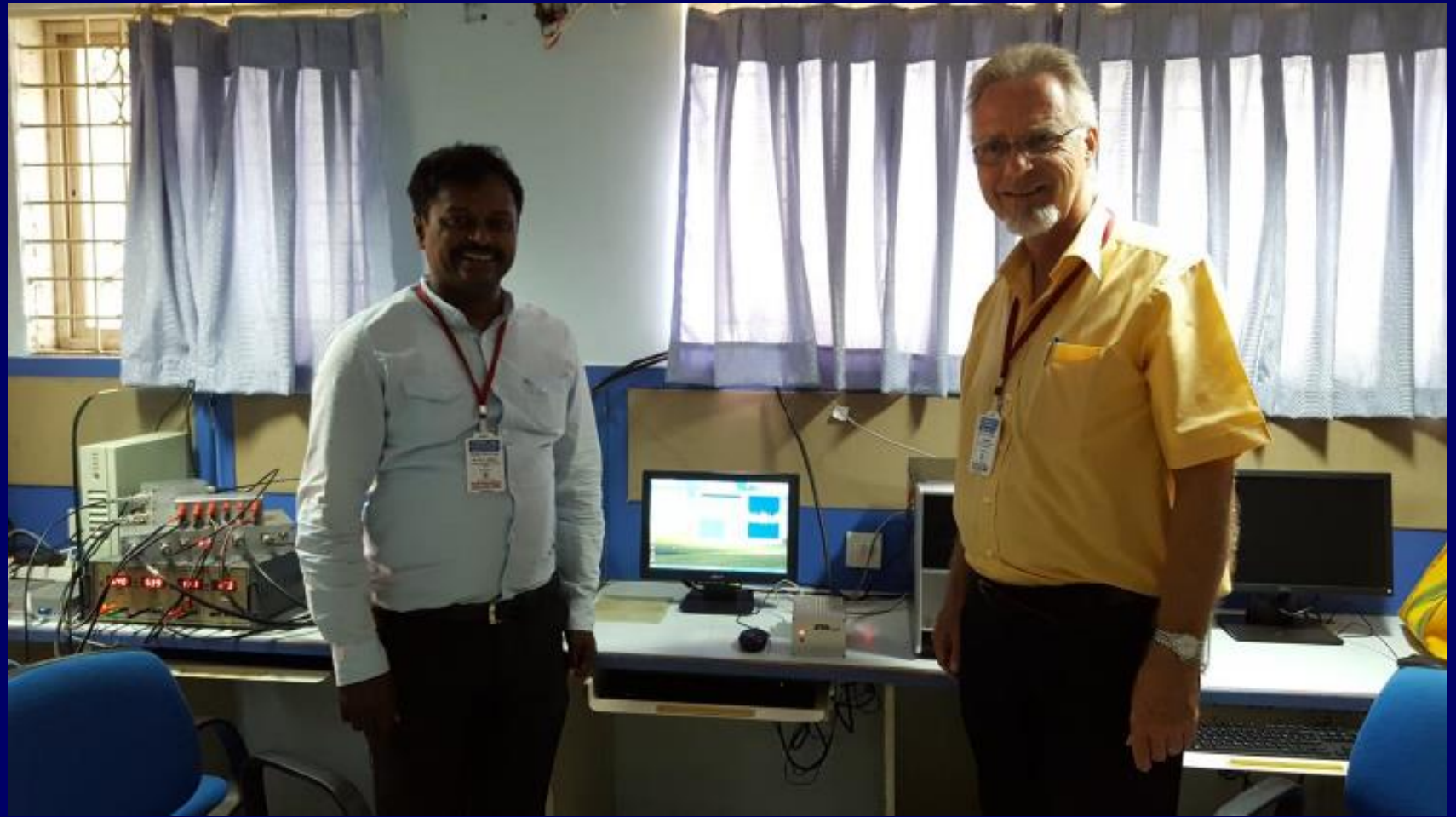
Rajmal Jain, Kadi Sarva Vishwavidyalaya, Gandhinagar, Gujara, India

# Station Pune reloaded, India



K. Sasikumar Raja and Prasad Subramanian,  
Indian Institute of Science Education and Research in Pune (IISER)

# New station Sangli, India



Dadso Shetti, Smt. Kasturbai Walchand College, Sangli, Maharashtra, India



# New Station Chiang Mai Thailand

Nikom Prasert  
National Astronomical Research  
Institute of Thailand  
191 Siriphanich building,  
Huay Kaew Road  
Muang District, Chiang Mai  
Thailand 50200

They procured an instrument without  
providing images or data.....

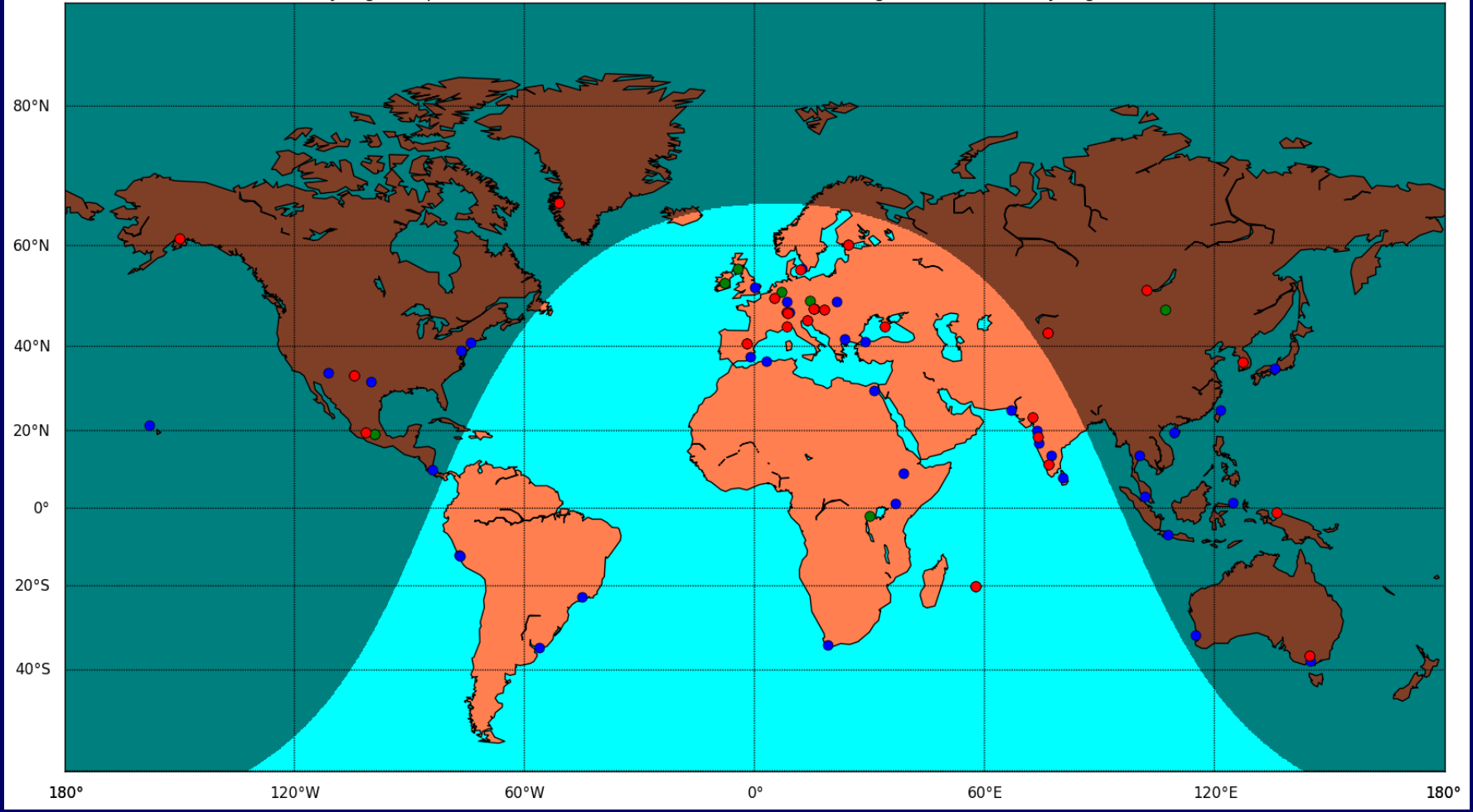


# Stations lost

- DARO Germany 2 instruments (lost motivation)
- Nairobi Kenya 1 instrument (many reasons)
- SWMC Egypt 1 instrument (many reasons)
- Costa Rica 1 instrument (no more contact)
- Pakistan 1 instrument (political reason)
- Malaysia > 5 instruments (responsible people moved away)
- Australia 1 instrument (lost motivation)
- Mongolia 1 instrument (many reasons)
- Hawaii 2 instruments never set into operation (lost contact)
- Japan 2 instrument never set into operation (no information)
- ~ 50 other stations do not provide data and/or have never been set into operation (several reasons)

# New function website

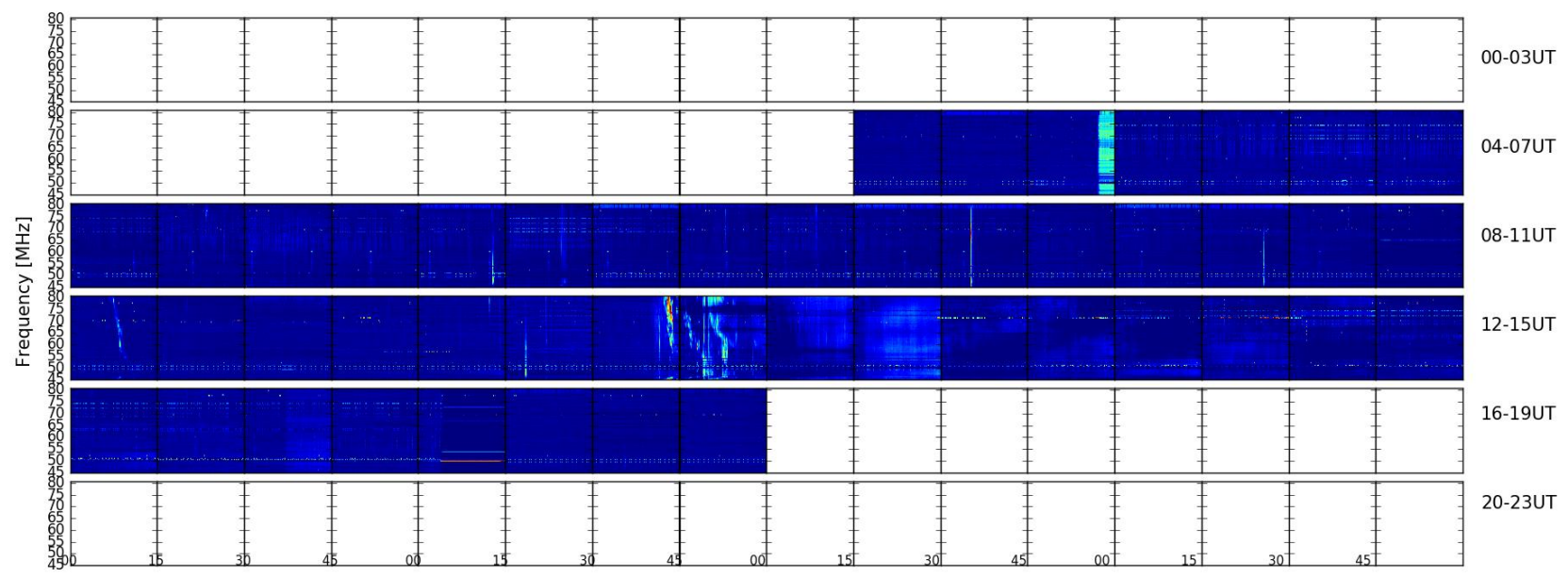
Callisto Day/Night Map for 12 Dec 2016 11:31:43 (UTC), blue=no data, green=data two days ago, red=current data



Status January 2017: 133 instruments at 67 different locations worldwide.

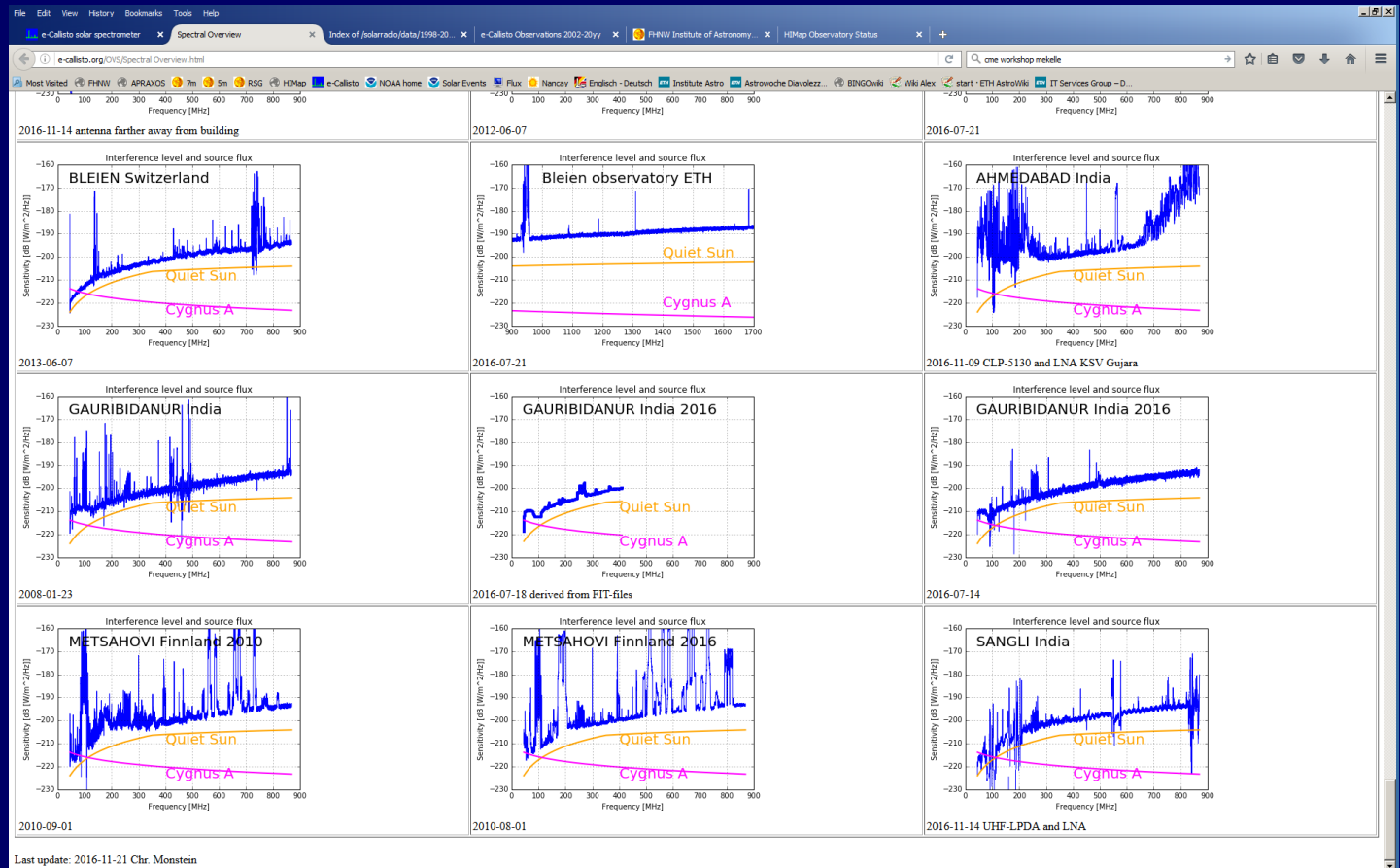
# New archive function: Daily overview per station

Full day spectra 2015/11/04 station: GLASGOW with focus-code: 59



Quick overview about solar bursts and local rfi

# New archive function: Spectral overview per station



Radio frequency interference is getting more and more an issue...





# Workshops 2016/2017

3 day workshop Gandhinagar, India Nov. 2016, Rajmal Jain  
2 day workshop Sangli, India Nov. 2016, Dadaso Shetti

One week workshop planned at Mekelle University, Ethiopia  
19 – 25 February 2017 (Lead: Gebregiorgis Abraha)

# Current User Statistics



~ 720 worldwide visits per month from 134 different countries

~ 60 GByte solar radio data per year (gzipped FIT-files)  
freely accessible for everyone

40 Tera Byte data archive available at University of  
Applied Sciences, Institute for 4D technologies (FHNW) in Brugg/Windisch.



# Possible students projects

- Identification of - and statistics about - solar radio bursts
- Determine velocity of CME from type II bursts
- Occupancy of spectrum over a longer period of time → do we have free channels?
- Monitor local rfi and keep contact to OFCOM in case of illegal transmissions
- Far field calibration with an rf-generator/noise source/drone → calibration process
- Variability of UHF satellite transponders → potential calibration sources
- Invent a method to qualify Callisto observatories sites regarding rfi and regarding burst sensitivity as a measure for data quality
- Measurement campaign per country → find radio quiet zones
- Setup interferometer to determine the diameter of the solar corona
- Build a down- or an up-converter for other frequency ranges



# Problems, issues

## Major problems in developing countries:

- Missing know how in: Operating & maintaining instruments
- Missing know how in: Data analysis and associated tools
- Missing know how in: How to write a report or a paper
- General: Sustainability of the network

## Problems of PI:

- Visibility at different levels (institute, university, country)
- Funding situation to install, operate and maintain instruments
-



# Conclusions

- Network is still growing, currently requests from:  
Kolkatta and Hyderabad, Ethiopia still on the agenda)
- Geographical coverage to be improved, especially American/Pacific region
- Data quality is improving (learning process)
- rfi situation is getting worse worldwide
- More science could be done (educational problem)
- Only very little funding available to further support  
instruments & training in developing countries.  
In September 2018 funding → 0 due to my retirement



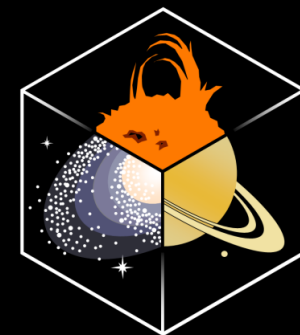
# Additional information:



<http://e-callisto.org>



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