

# SPIN

MONITORING A  
RESTLESS EARTH

<http://spin-itn.eu>

# WP1 – discussion summary

## Instrument Inventory

- Has been added to the Padlet, please continue to add, we put it into repository

## Experiment to validate gradient sensitivity

- Considered as a worthwhile pursuit
- Need controllable structural **change**
- Need differential effect (before/after)
- Water tanks (filled/removed daily)
- Link to ongoing experiment in Lyon (water reservoir)?
- Man-made structure (cavity with water, cement)
- During 2nd workshop at the beach?

## OBS 6C

- Connect with Bruit-FM project, plan zoom meeting soon
- LMU/UHH 6C prototype close to be employable (needs power access)

## Specific experiments/field work

- Stromboli June 2022, combine with IPG/DAS, additional OBS 6C deployment
- Metamaterial experiment Germany January 2022
- Connect to ITN IMPROVE!
  - Experiment at Etna in Sep 2022
  - Experiment in Iceland in 2022 (?)

## Monitor emerging technologies

- Cold Atoms (maybe plus gravity measurements, R. Geiger, Paris)
- 1C High res sensor iXblue
- New strain sensors (P. Bernard, IPG)
- Beam balance and Quartz based rotation sensing (Seattle, LIGO)
- Ringlaser (NG, higher resolution after upgrade as 6C reference sensor)
- DAS/DSS/DTS combined technology
- Telecom seafloor cables for long range strain observations

## WP2 – Discussion summary

- Understanding of physics is required to link observations
- deformation
- earthquakes / aftershocks
- velocity changes
- variations in strength
- Seismological observations can be explained with a variety of models
- Lab experiments are key to constrain physics of time dependent processes
- strong ties between ESR 2.1 and 2.2. Project 2.3 needs to be connected better
- coordinate with WP3 for the modelling

## WP3 – Discussion summary

- Integrate interrogation into WP1 and WP4 (short course)
- What is the character of nonlinearity?
  - connection with lab experiments

## WP4 – discussion summary

### **1) We identified need to coordinate field experiment, or at least, to inform each other about SPIN internal and external experiments**

→ We will install a living document on instruments and a calendar (Nextcloud?) for the exchange; Heiner proposed this during the WP1 discussion already

### **2) We think it would be beneficial to re-think the links between WP4 and the other WPs. Maybe people got new ideas during this workshop, now knowing more about the plans of others**

→ Next SPIN WS? Or earlier?

### **3) We talked about alternative methods (eg gravimetry and magnetotellurics) and new developments (muon tomography) that may be of interest.**

→ Could be interesting to have at some SPIN event a presentation of someone working on, for example, muon tomography

### **4) We discussed practical aspects of DAS such as new developments and installations**

→ Could be interesting to organise a workshop on practical aspects of DAS (as we actually thought of doing as a Short Course)

## Further Discussions – cross-WP coordination

- |                                      |                               |
|--------------------------------------|-------------------------------|
| ▪ Numerical Simulations              | Zihua Niu                     |
| ▪ Rheological models                 | Manuel Asnar                  |
| ▪ Lab experiments (& scale transfer) | Declan Andrew                 |
| ▪ Deployments & Datasets             | Julius Grimm (+ Eleonore, ..) |
| ▪ OBS                                | Mohammad Amin Aminian         |

→ Meet in sub-groups **before mid-january**,  
short report at next SPIN jour fixe (17.01.2022)

## Bi-weekly SPIN seminar

Establish regular, **bi-weekly seminar** (e.g. on friday)

1 hour max, flexible format, topics determined by ESRs

- New scientific results in 15 mins
- Transferable skills
- Question rounds
- Arts & Science
- ...?

→ poll, would you participate?

## Media & E-infrastructure

- Send presentation pdfs → Celine
- Presentations uploaded to spin webpage: <https://spin-itn.eu/ws1/>
- SPIN Youtube:  
<https://www.youtube.com/channel/UCcsvKNYDSbeGuOVRhHZobIA>
- Zoom sessions were recorded, some presentations may be uploaded to youtube. We will contact you beforehand for consent.
- Github: <https://github.com/spin-itn> (&wiki?)



# Information flow

## We will set up:

- WP mailing lists or WP channels on discord, slack, similar platform
- Shared drive to exchange documents, literature, etc
- Shared (living) documents for instrument pools, projects, etc
- Calendar → deployments, other project events, ...

# Upcoming events

# 1st Short course at Geodetic Observatory Wettzell, Germany

*29 march – 2 april, 2022;*

## Technical programme

- Setting up seismometer, fiber optic gyroscope, DAS
- Basic principles of different sensors
  - (seismometer, ring laser, FO gyro, DAS)
- Sensor testing and calibration
- Instrument installation in extreme environments
- Guided tour of observatory
- Practicals:
  - Jupyter notebooks,
  - Hands-on work with sensors
- Acquiring instruments, organizing field work, ...



# Second SPIN short course + workshop: near Bordeaux, France

*New physical models of the Earth's interior / Physics & dynamic processes*

End of April/May 2022

Organized by GFZ

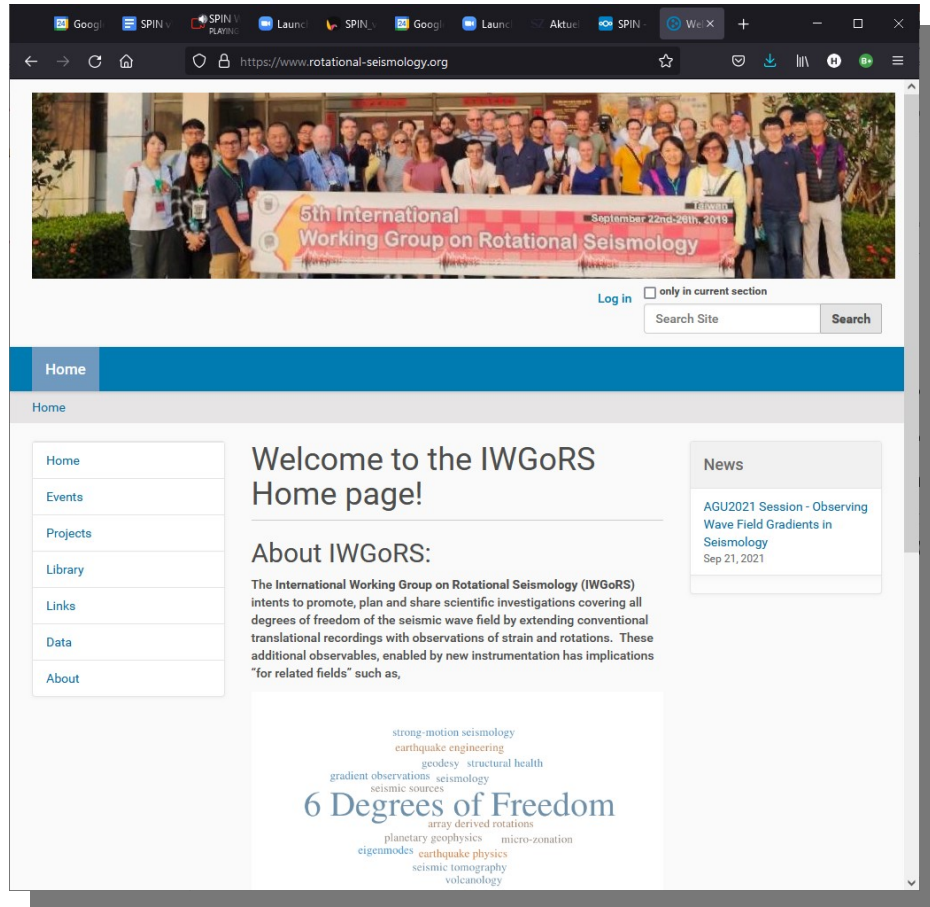


**GFZ**  
Helmholtz Centre  
POTSDAM



# IWGoRS-SPIN Joint Workshop

Tentative date: October 10-13, 2022; iXblue St. Germain-en-Laye



Workshop on all aspects of rotation and strain related seismology: instrumentation, theory, applications



iXblue



# Thank you!

- General organization: Baerbel
- Programme, Sessions: Christoph, Cedric, Heiner, Andrew
- Gather Town: Zihua, Sven, Sabrina, Andreas, Antonia
- Zoom: Antonia
- Student icebreakers: Tjeerd, Sebastian, Julius
- .. and all the participants for their contributions!

## Never stop dreaming!

# Come to Novemberfest!

