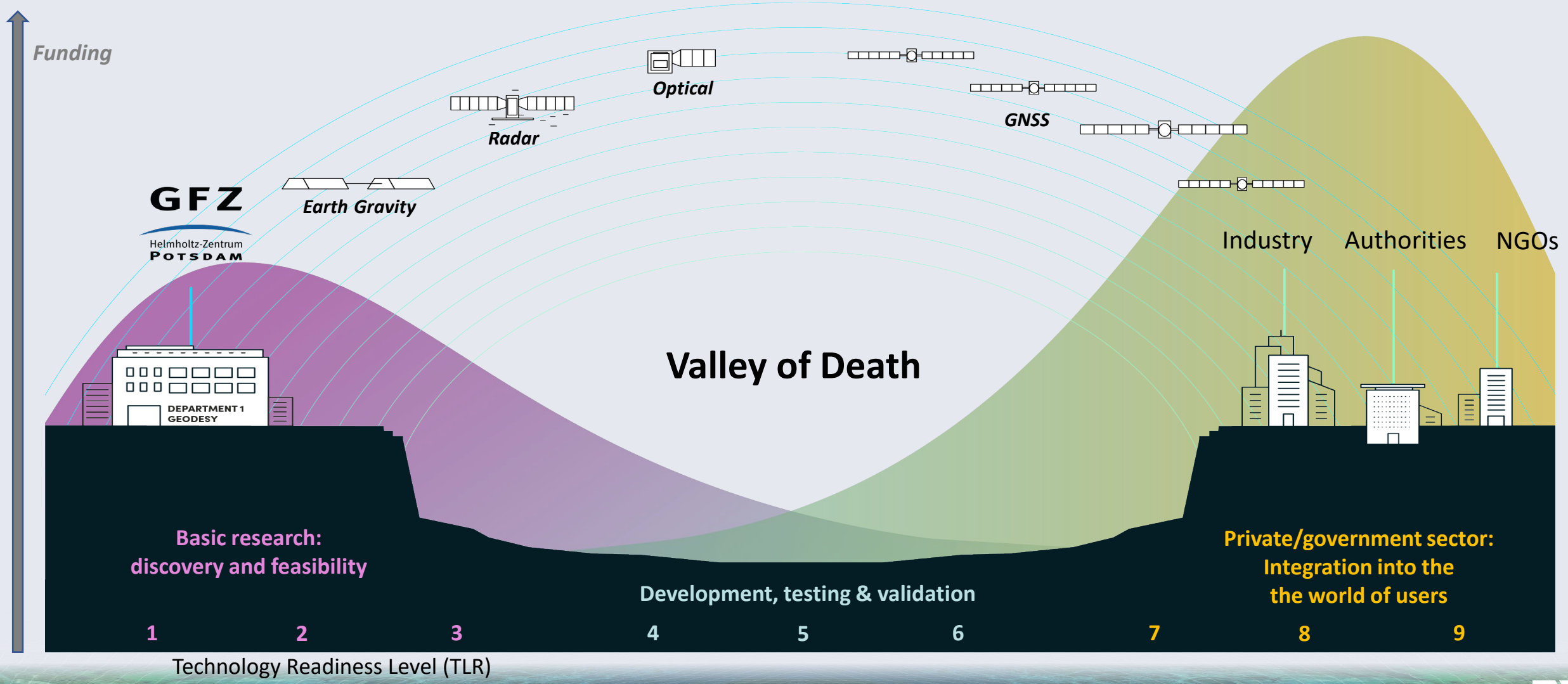
Technology Transfer
From science to market and society
Lessons learned

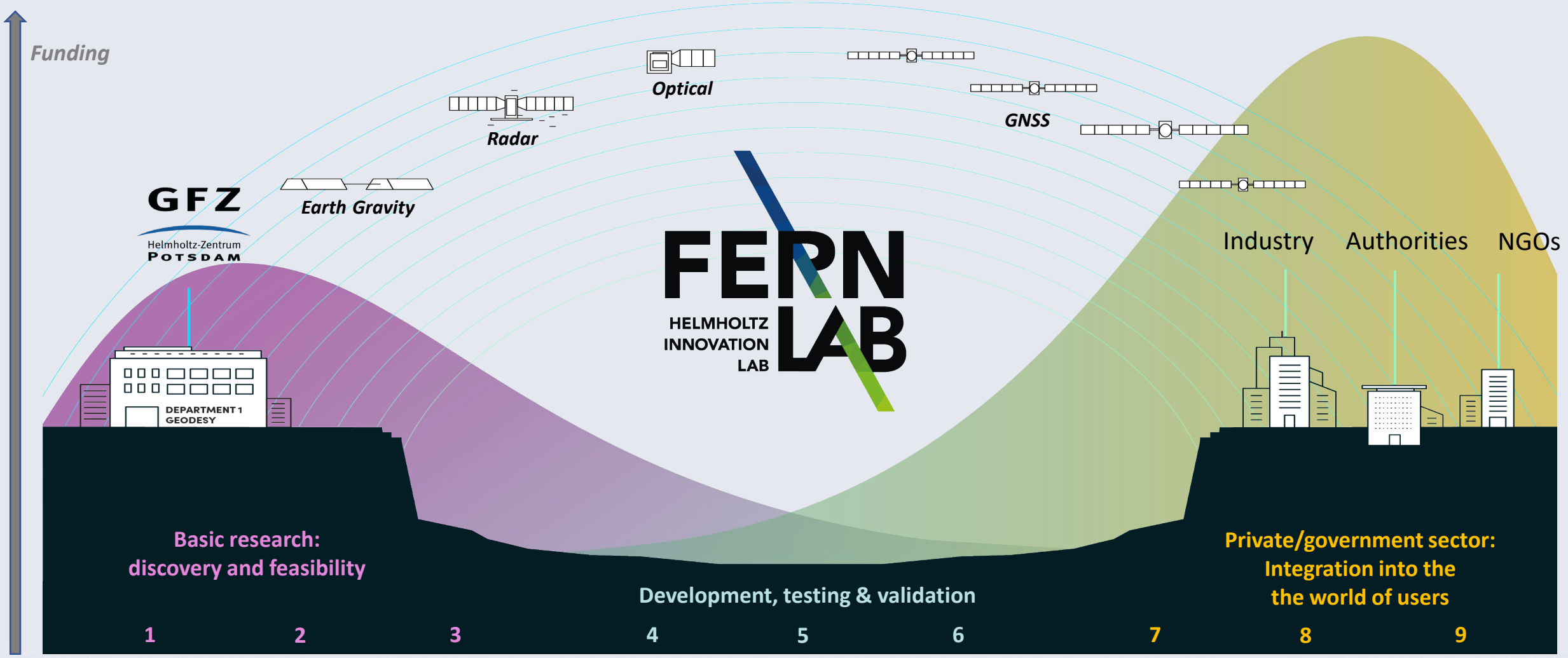
Daniel Spengler, Julia Neelmeijer, Alison L. Beamish, Robert Behling, Romulo Goncalves, André Lingenfelser, Arash Madadi, Daniela Rabe, Daniel Scheffler, Maria Thiele

Department of Geodesy, Section of Remote Sensing and Geoinformatics
Helmholtz Centre Potsdam – German Centre for Geosciences (GFZ)

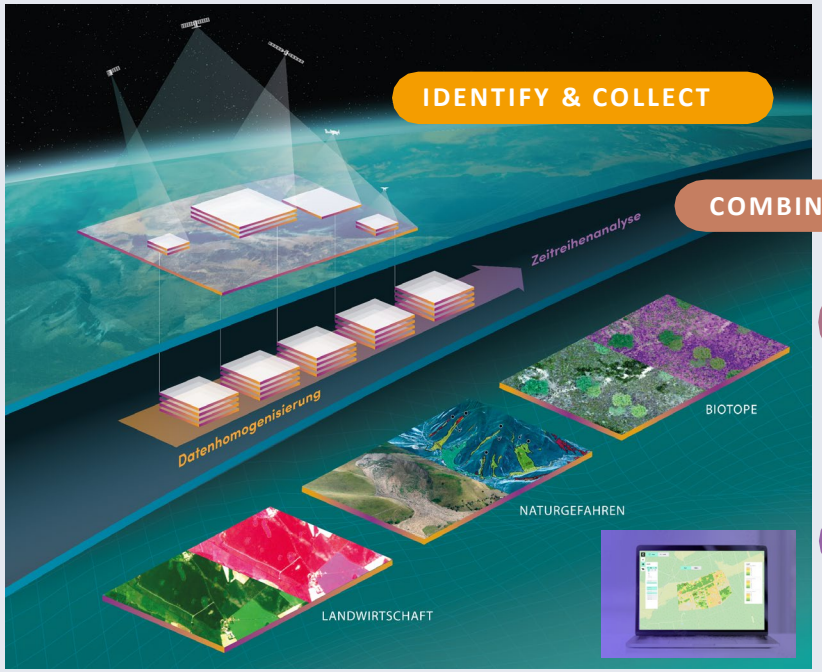
Transfer in remote sensing – the status

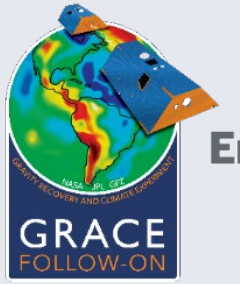


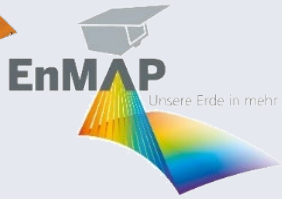
Transfer in remote sensing – the chance



FERN.Lab vision and aim







	European Union (EU27)				Global	
	2021		2031		2021	2031
	Value	%	Value	%	Value	Value
Data revenues (€ m)	82	15.4	117	14.6	536	797
Value-added service revenues (€ m)	342	15.3	664	14.2	2,236	4,662

EO and GNSS Market Report, 2022

IDENTIFY & COLLECT

Selection of sensor and data for specific applications

COMBINE & PROCESS

Data processing and combination

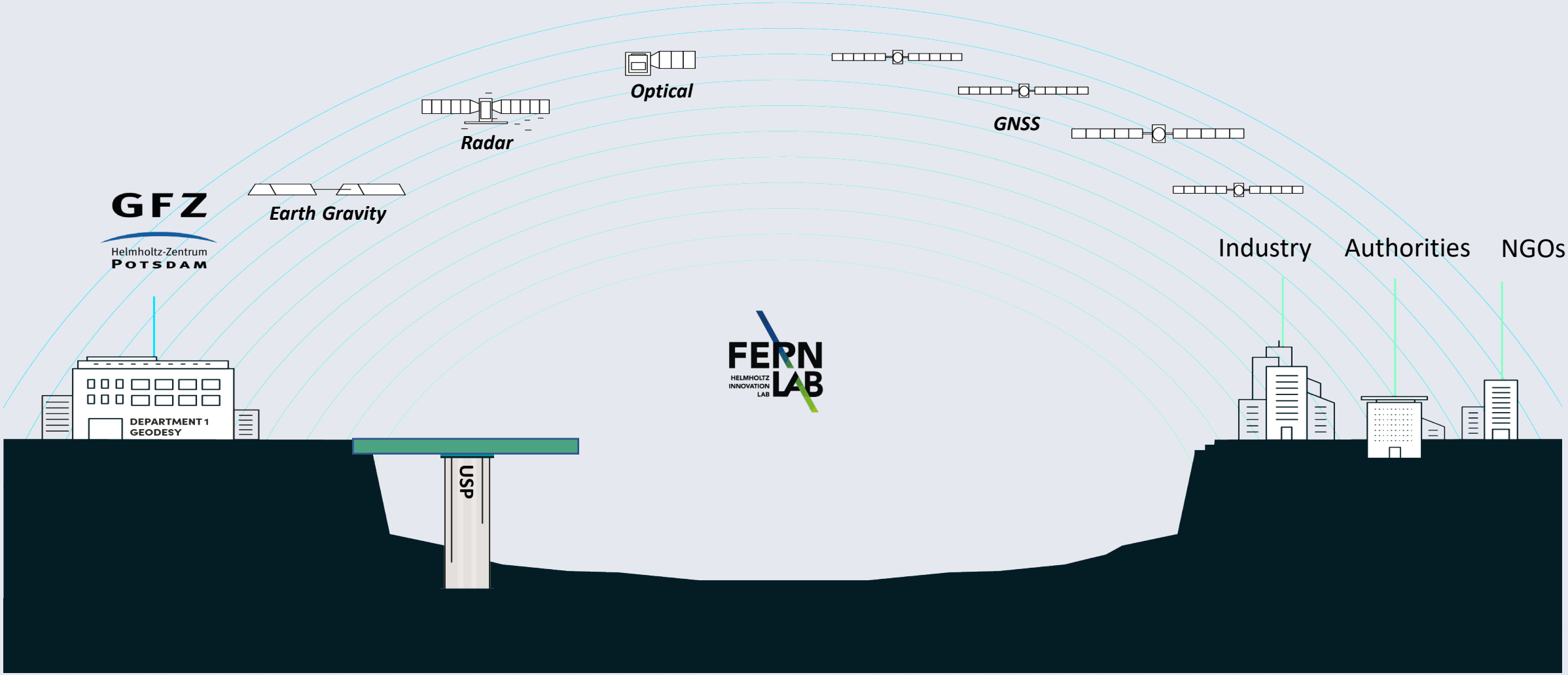
ANALYSE & TEST

Method development and validation

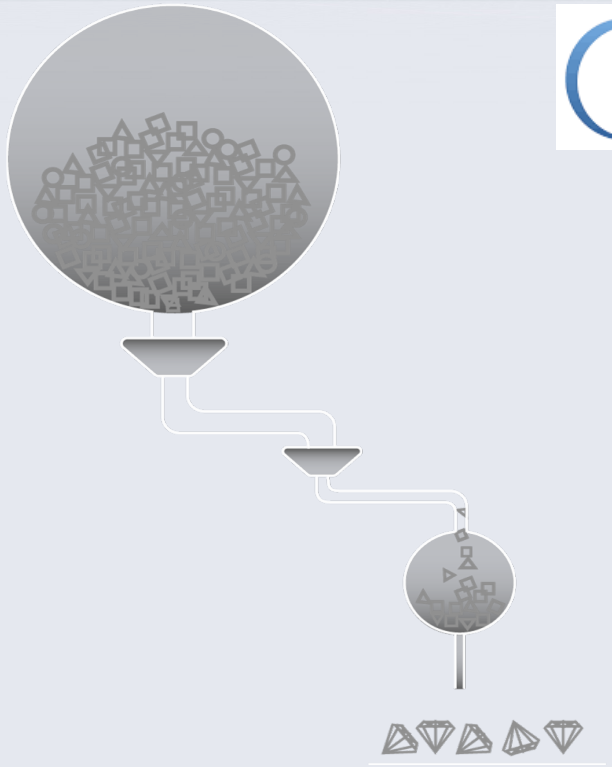
IMPLEMENT & APPLY

Operationalisation and valorisation

Building the bridge – requires pillars



Definition of FERN.Lab USP



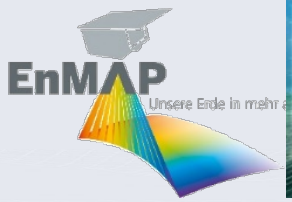
- Based on technology screening → diamond selection!
  - >70 technologies at GFZ Department Geodesy

  - Hyperspectral data processing and analysis
  - Earth Gravity data processing and analysis
  - Data processing, homogenization, multisensoral analysis
  - Topic specific data analysis (e.g. habitat mapping)

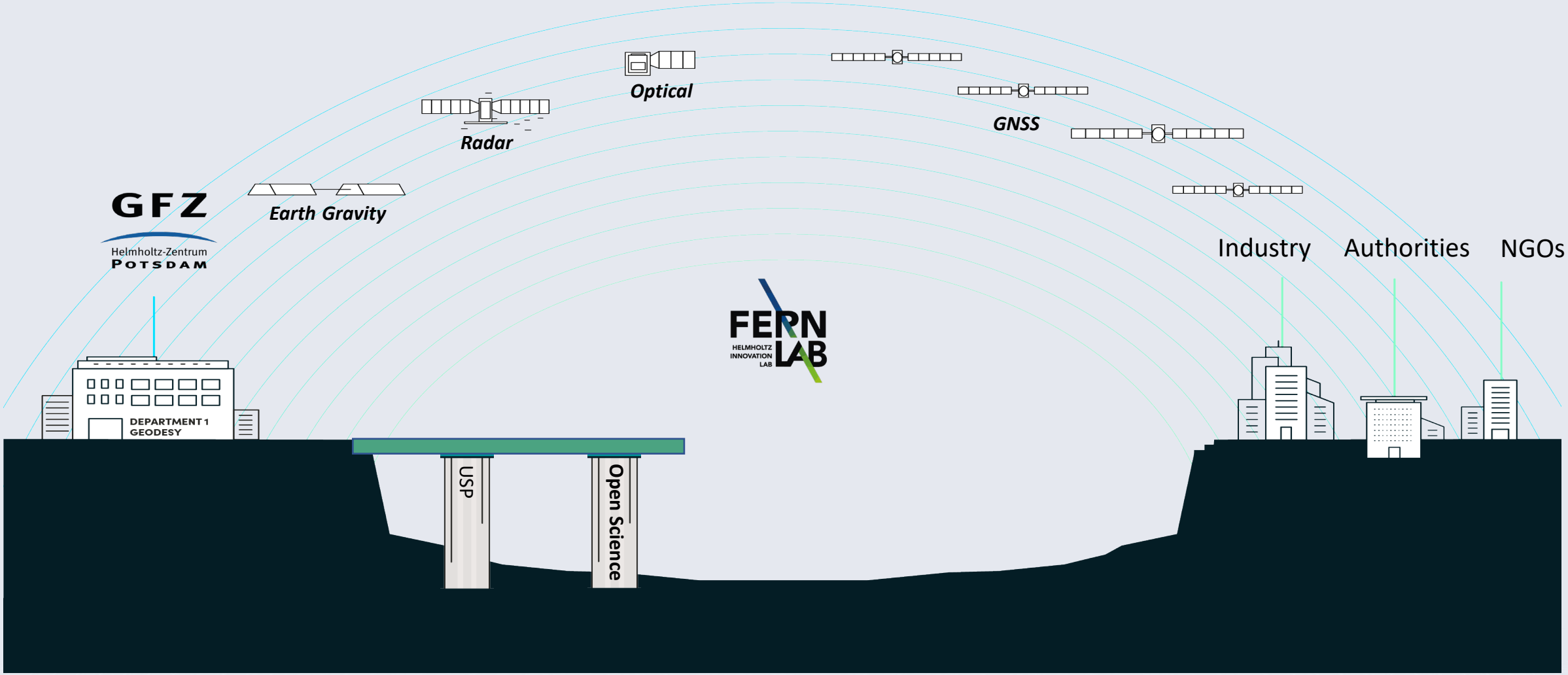
Open questions to answer

- Finding place at market….
- What is required by the market? Market needs?
  - High quality analysis ready data
  - custom made solutions
  - …

Unexpected long process!



Building the bridge – FERN.Lab lessons learned



Open Science

- Germany [Helmholtz Association of Research Centers] is pushing Open Science
- Benefits for scientist, following open science objectives
  - Visibility
  - Increasing impact of research
  - Increasing network

- Technology Transfer requires a change of the scientist‘s mindset!

→ Commercial use does not have to be in contrast to Open Science

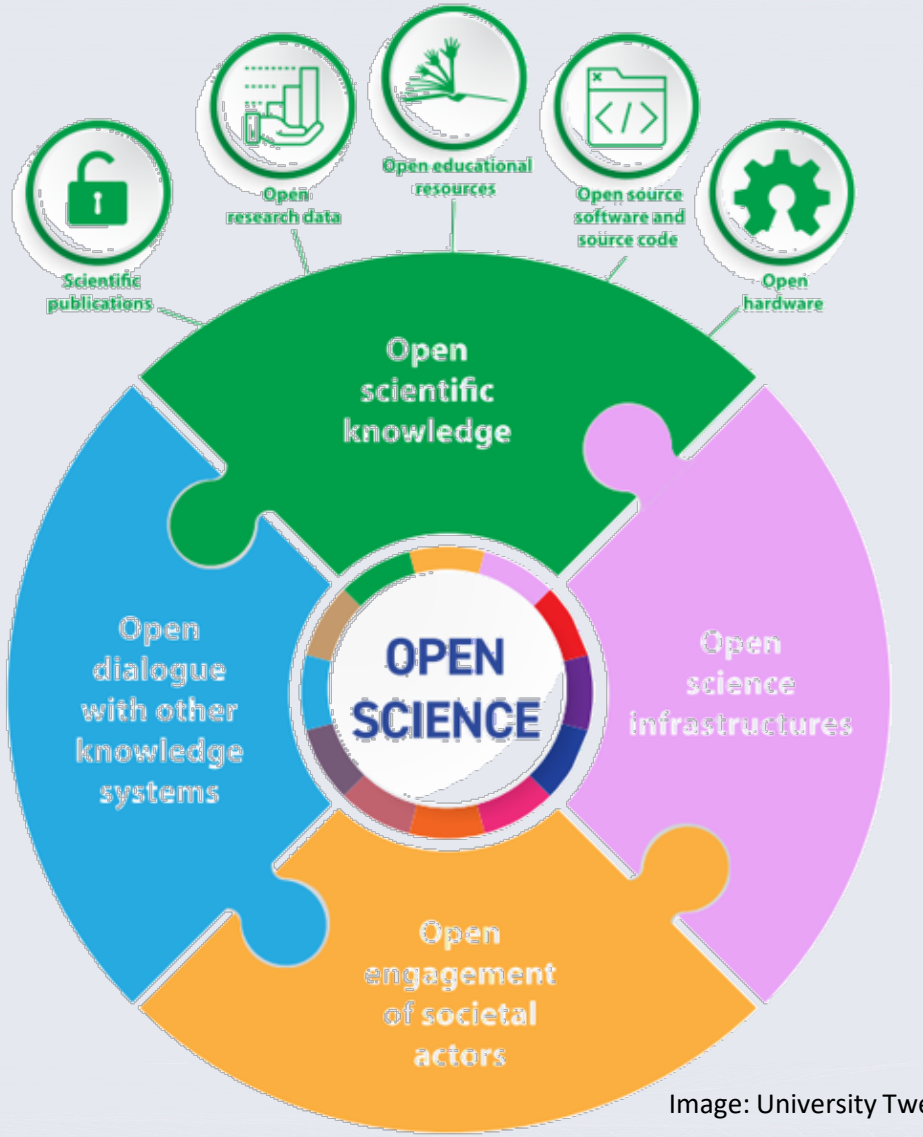
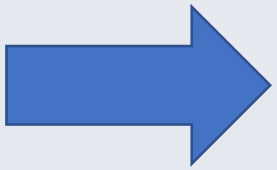
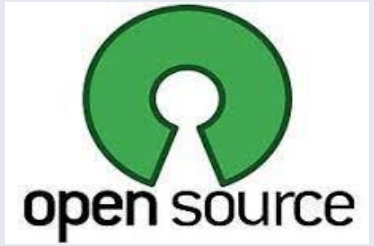


Image: University Twente

Building Transfer on Open Science





Software Sustainability

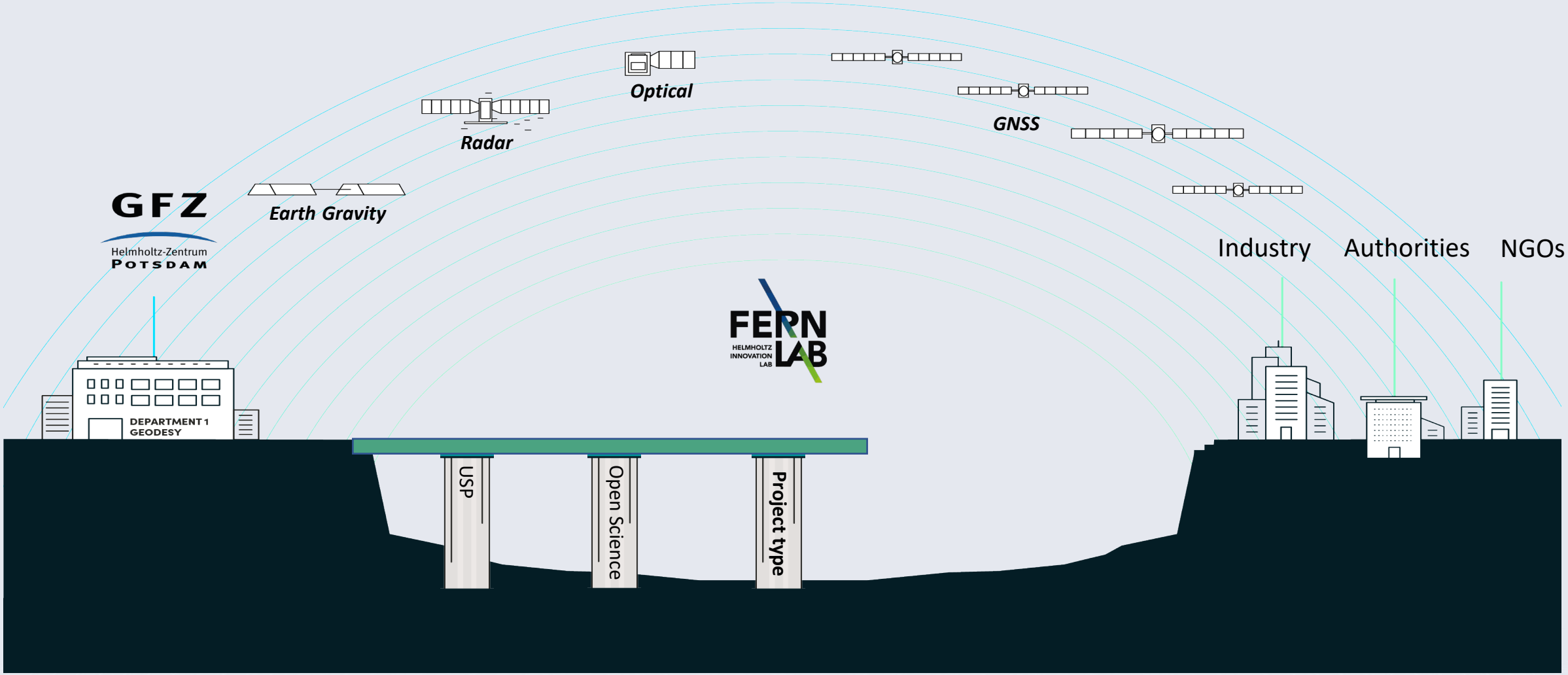
Commercialisation:
- Dual Licencing
- Software Patenting

Addons:
- E.g. UI, API, advanced feature, customization

- Collaboration with scientist

- Open Source Version
- GPLv3 Licence

Building the bridge – FERN.Lab lessons learned



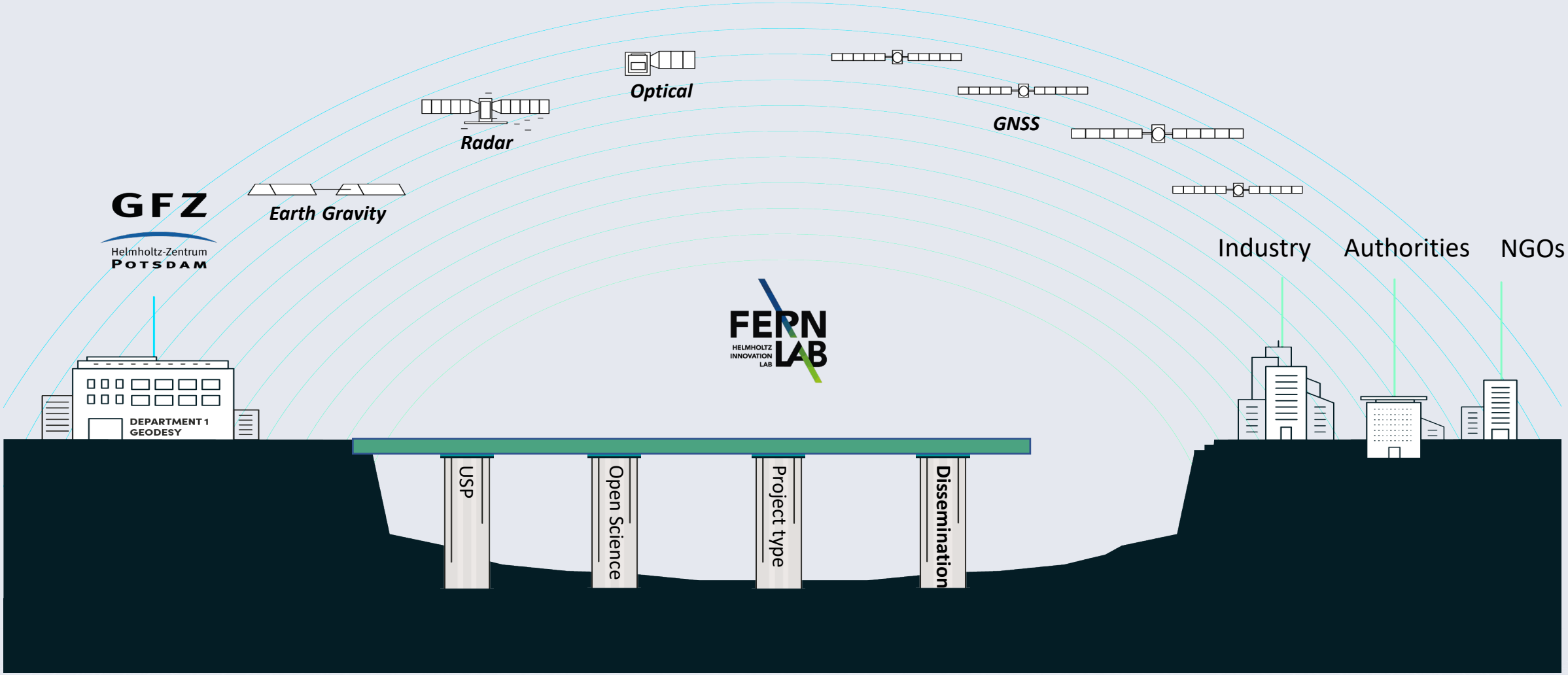
Project types

In-house developments	R&D 3rd party	Contract research	Honest Broker / Internal Support
Time investment: 50%	**Time investment:** 35%	**Time investment:** 10%	**Time investment:** 5%
Aim: increase TRL Level of GFZ methods, bridge the gap to operational use	**Aim:** work jointly with potential end-users on product development	**Aim:** develop product for customer	**Aim:** support of GFZ scientists -> raise awareness of TT topic
Focus: ▪ technology + knowledge transfer of existing open source solutions ▪ testing different TT paths ▪ **High internal need**	**Focus:** ▪ transfer-focused 3rd projects finance via ZIM network/ other party calls ▪ revenues via license/sell software/IP ▪ **Strong request by German SMEs**	**Focus:** ▪ direct payment for developing work ▪ revenues via license/sell software/IP ▪ **Lower request compared to expectation → long negotiation processes**	**Focus:** ▪ support proposals/ workshops ▪ counselling (licenses, tenders, spin-off founding) ▪ improve GFZ-intern processes

Evaluation of project types

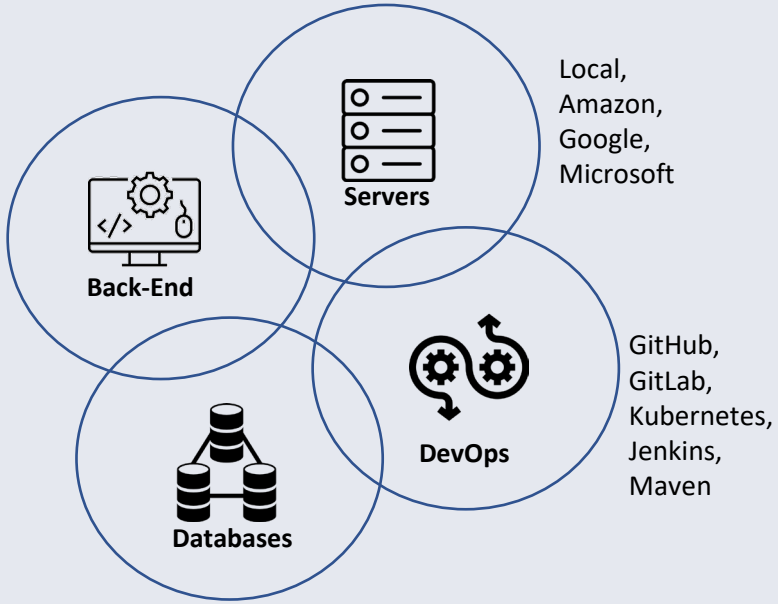
- Rating required time and revenue (financial, but also non commercial e.g. visibility, new cooperations)
  → criterias for sucessful transfer are required

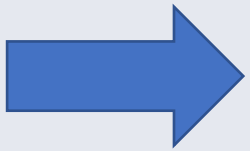
Building the bridge – FERN.Lab Lessons learned

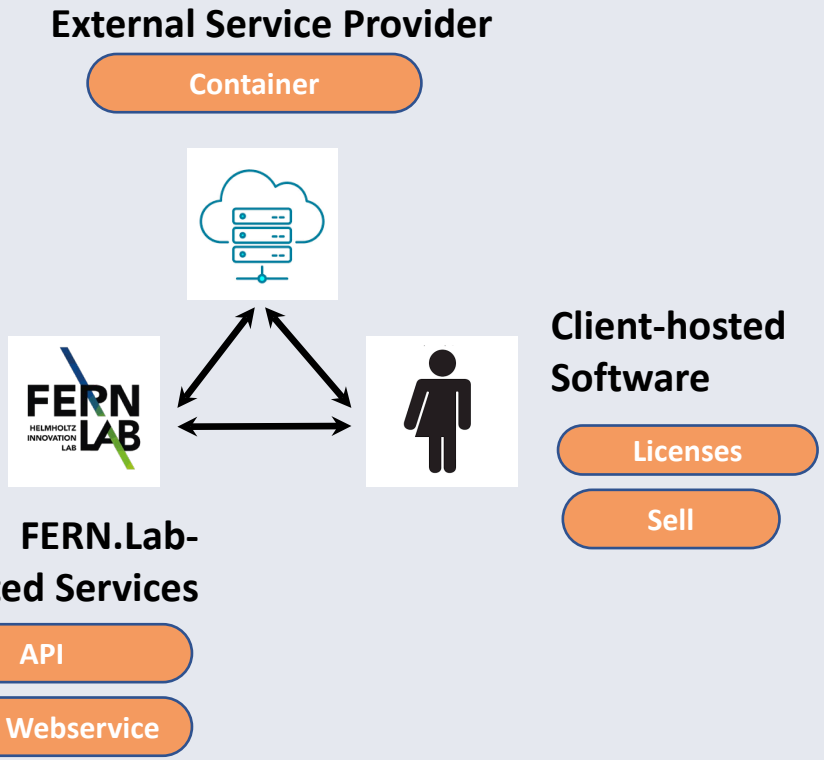


Dissemination

Backend

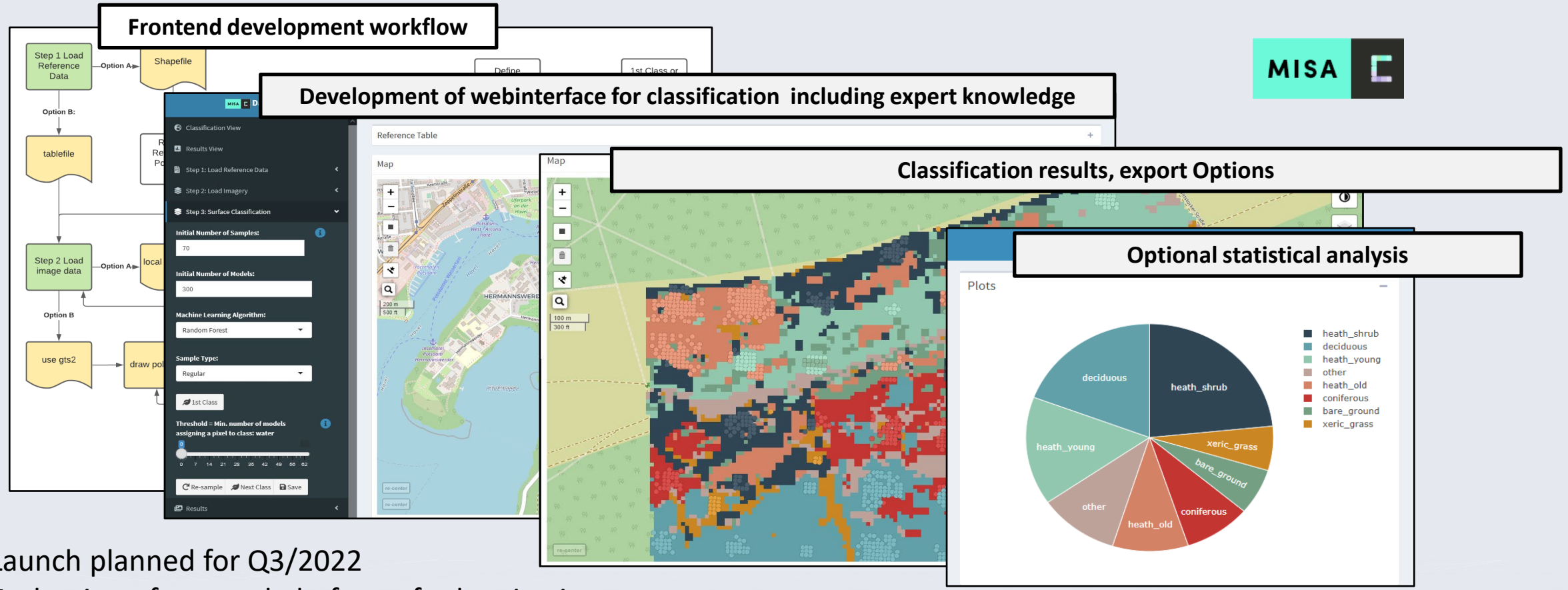






Full Stack Service Development – Minimal Sampling Classifier

Based on Open Research Software Development Habitat Sampler (C. Neumann)



MISA

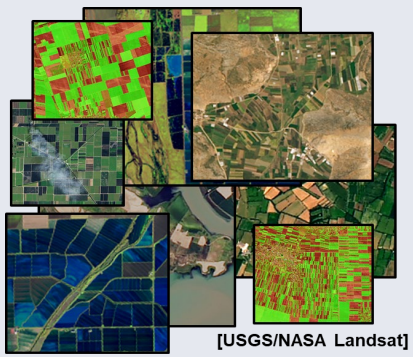
Launch planned for Q3/2022

Evaluation of external platforms for hosting in process

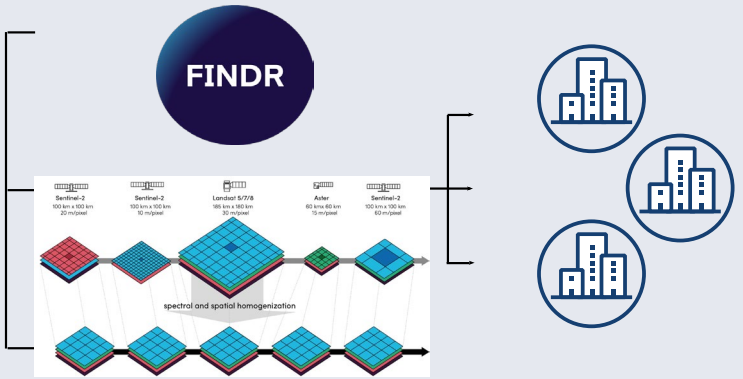
API on Cloud Infrastructure

FINDR: 02/21-06/23

- EU 3rd party project: ConstellR (D), Cyphronet (PL), eLeaf (NL)
- Build a central platform for data from all satellite data providers (currently: multispectral data, planned also for thermal, hyperspec.)
- Download including automated data harmonisation for multi-spectral data sets
- Contribution to FERN.Lab method building kit

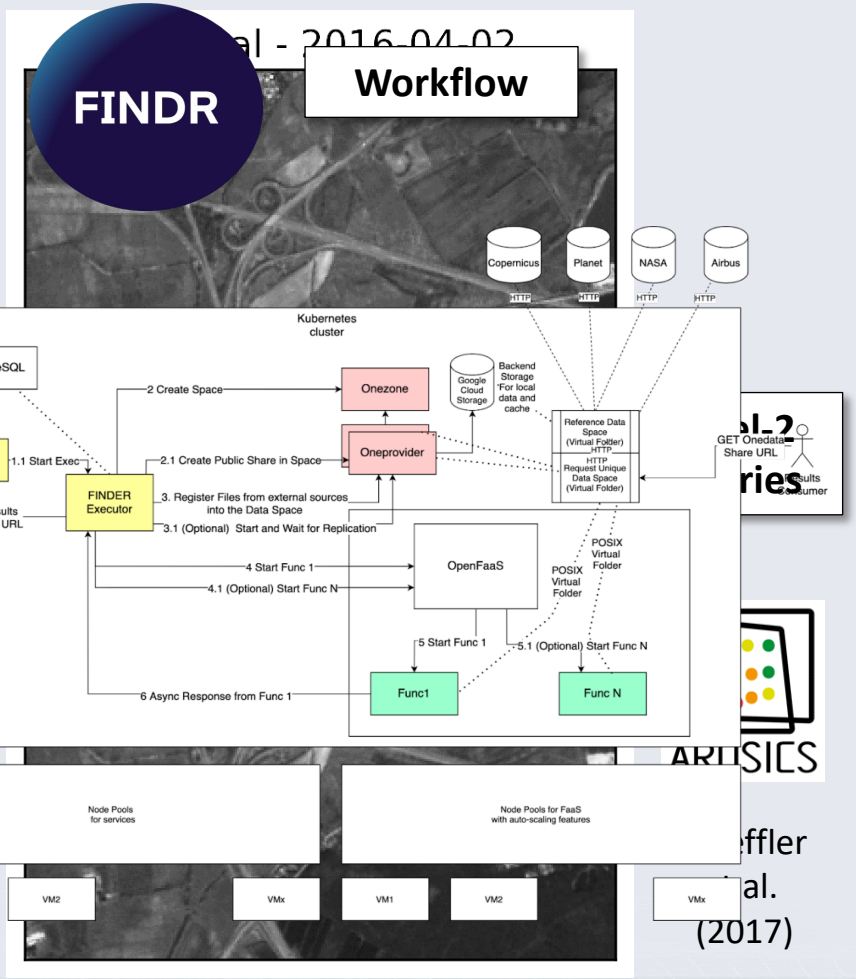


Data provider



Easy Data Access via FINDR homogenisation of multisensor data

Data user



ffler
al.
(2017)

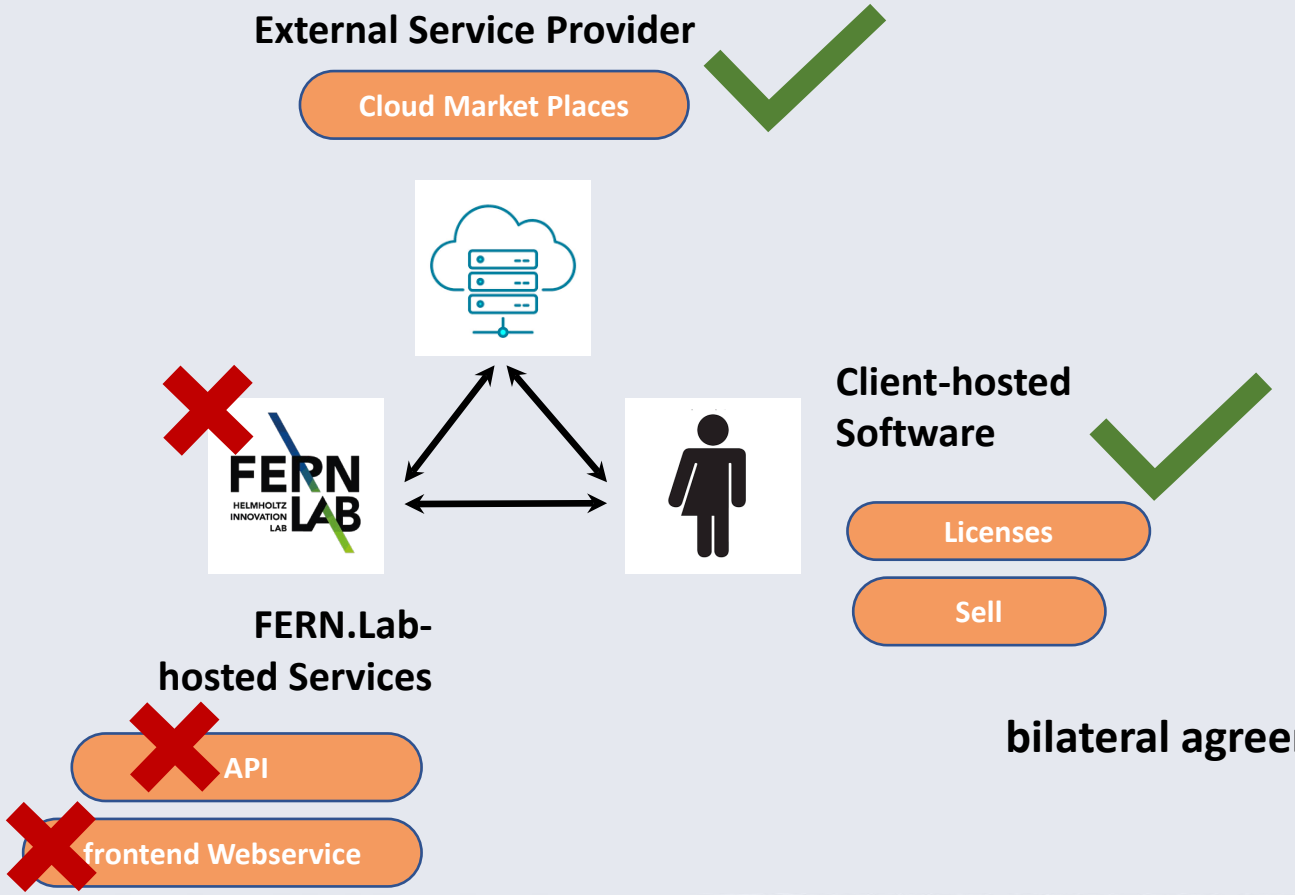
Dissemination

Increasing options of EO marketplaces

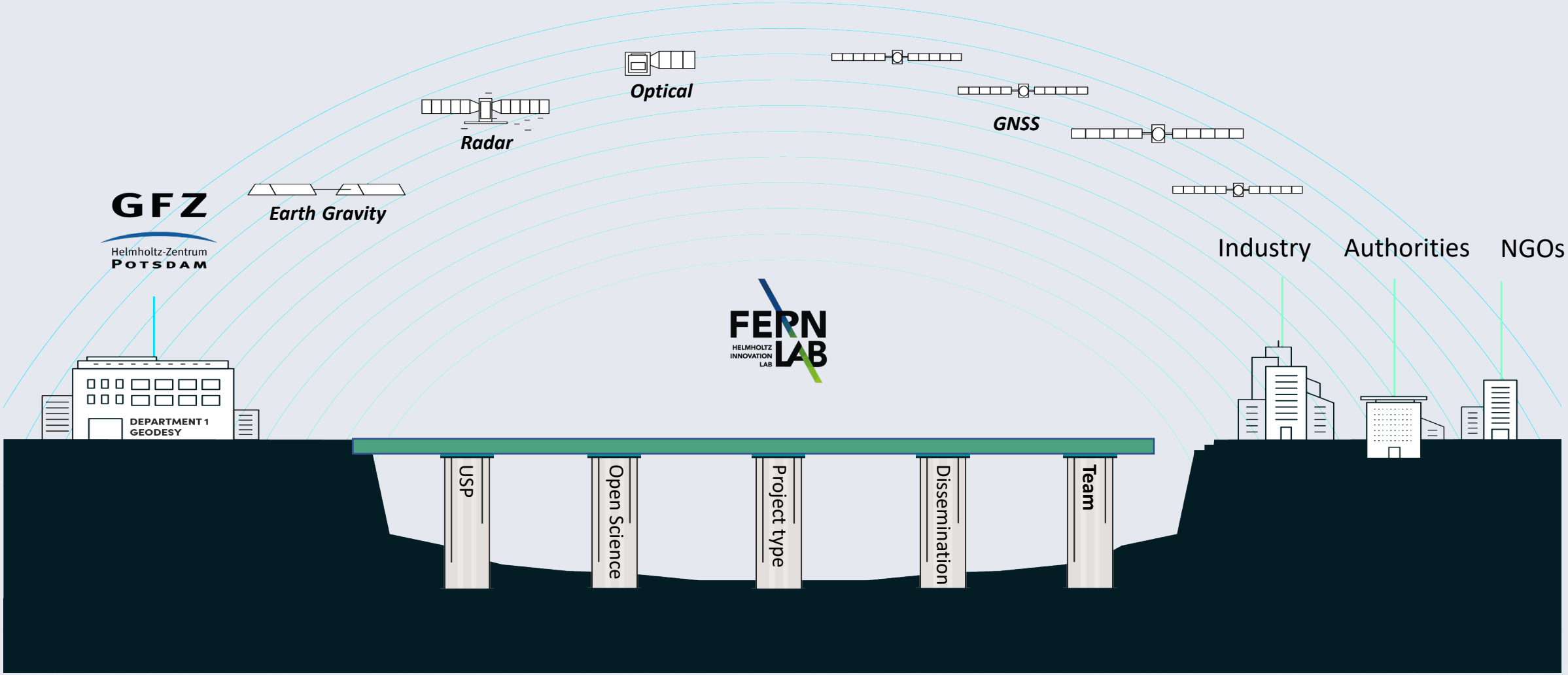
no self-hosted FERN.Lab services!

- Full Stack Development required
- User management incl. payment required

- Potential high effort for maintenance
- End customer market not foreseen in FERN.Lab strategy



Building the bridge – FERN.Lab lessons learned

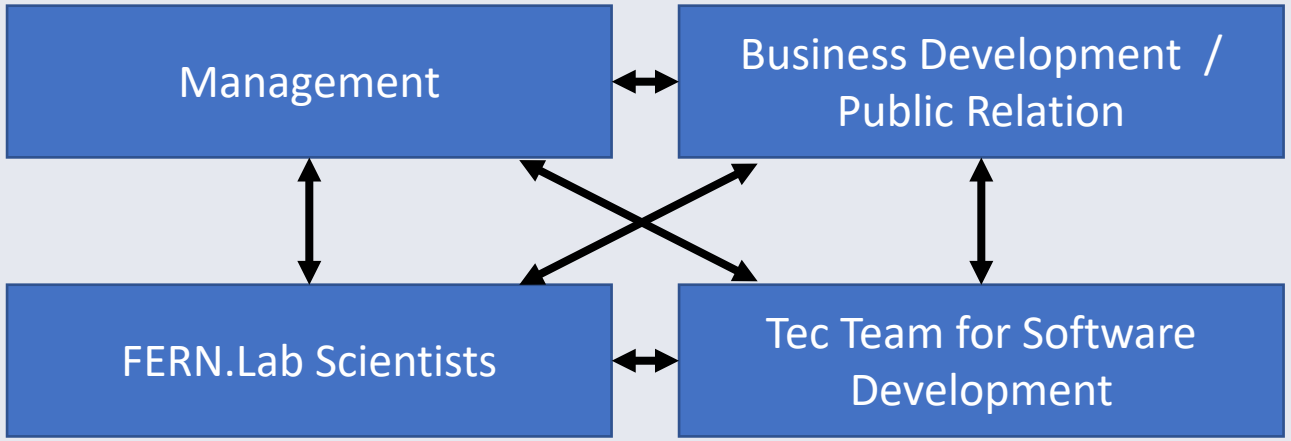


Required team skills for sucessful technology transfer for earth observation methods

- Multidisciplinary team

Required team skills for sucessful technology transfer for earth observation methods

Expert Scientist



FERN.Lab – Interdisciplinary Team - close to science!

Dr. Daniel Spengler
Management

Dr. Julia Neelmeijer
Management/Methods

André Lingenfelser
Business Development

Marianna Nitusova
Network Management

Maria Thiele
Public Relation

And many more scientists collaborating with FERN.Lab in different projects…

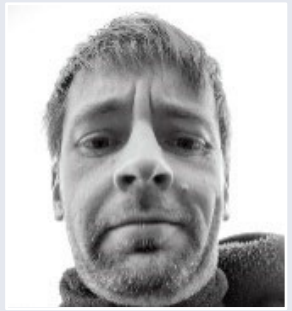
Dr. Romulo Goncalves
Software Development

Daniela Rabe
Software Development

Arash Madadi
Software Development

Dr. Robert Behling
Method Development

Dr. Alison Beamish
Method Development



Daniel Scheffler
Method Development

Future Vision

- **Launch of 1st Services in Q3/2022**
- **Integration of FERN.Lab into international transfer initiatives**

- **Improving internal communication → improving transfer awareness for scientists → incentives**

- **Blueprint for GFZ and other research center for valorisation of scientific software**

Rising awareness for technology- and knowledge transfer!

Science needs to be get in use!

FERN.Lab - Bridges the Innovation Valley, Key Messages

For sucess you need!

- Clear USP
- Technology and Knowledge Transfer based on Open Science
- Different types of cooperation options
- Different types of dissemination options
- Multidisciplinary team

- Time and support of your organisation

Get in contact with

fernlab@gfz-potsdam.de