From the idea to the innovation.

From the fundamental research to the society.

We live transfer.

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How can I make my
data / software / hardware / ...
useful for society?

From the idea to the innovation.

From the fundamental research to the society.

We live transfer.

Technology transfer has two main goals:

- support and strengthen culture of innovation

- establish effective structures for transfer activities

Knowledge and Technology Transfer

Transfer from research

- Classical practice: protect and exploit

Benefit for economy

- Better, more competitive services and products
- Higher profit for companies
- Higher financial returns for research institutions
- Higher national economic performance and competitiveness

Benefit for society

- Impact
- Better understanding of the world
- More beneficial or environmentally friendly processes and products
- Wider dissemination of solutions

Feedback for research

- Better alignment of research with societal and economic benefits

Legal Basis – Copyright

Definition: Copyright protects the creator's original work against unauthorized use.

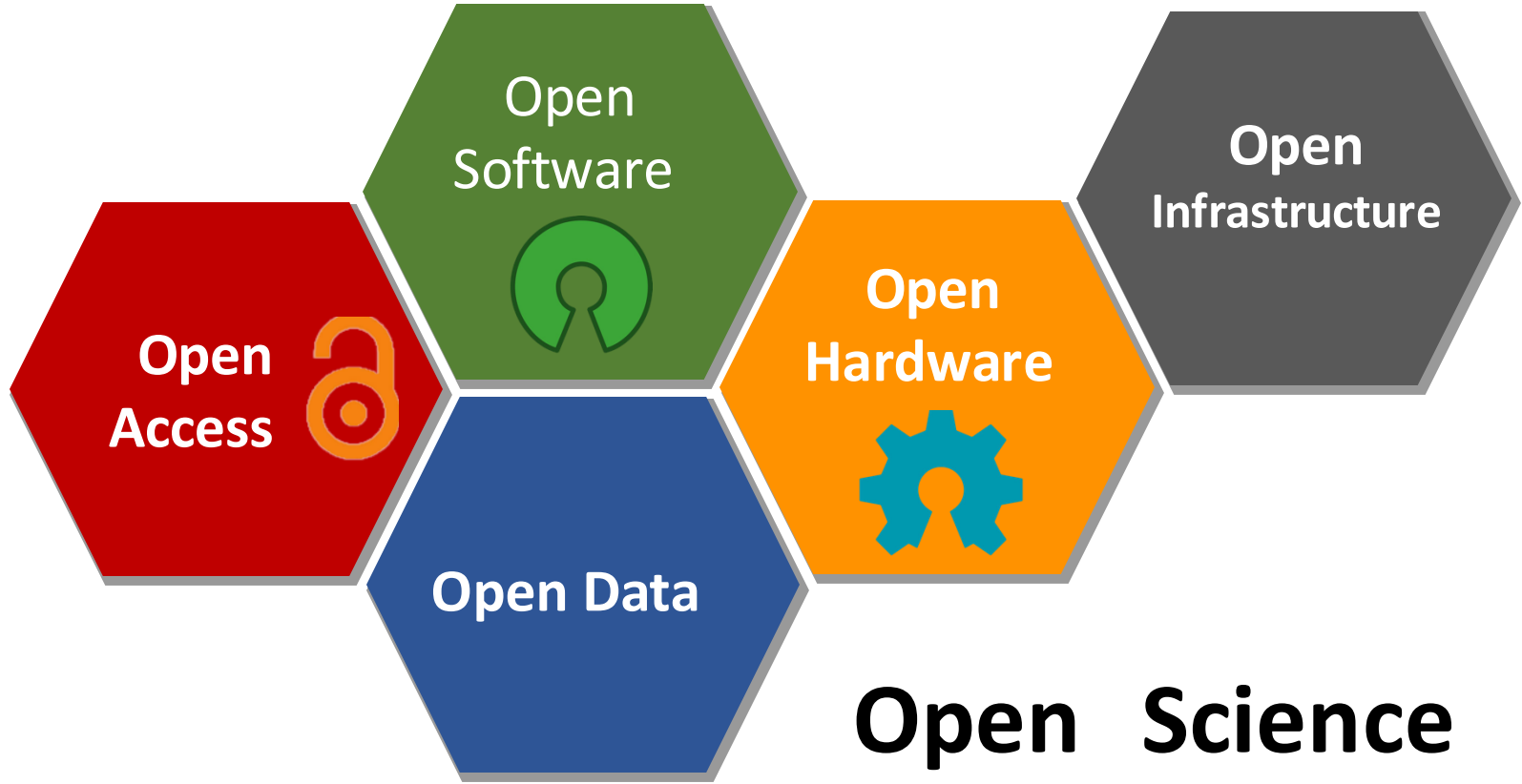**Scope**: Covers various forms—text, images, software, …

Rights: Includes moral rights (recognition) and economic rights (profit).

Duration: Lasts for the creator's lifetime + 70 years in many countries.

Exceptions: Certain uses allowed for education, private use, parody, etc.

Legal Basis – Exploitation Rights

Definition: Economic rights to use and profit from the work.

Usually belong to the employer.

Key Rights: Reproduction, distribution, adaptation, etc.

Exclusive Control: Decide who can use the work and under what conditions.

License and Transfer: These rights can be licensed or transferred to others for financial gain.

Duration: Typically lasts for the creator's life plus 70 years.

Popular misconceptions about Open Science

"Open Science must be free."

Free as in free food?

Free as in freedom?

Someone has to pay for
- Development & Scaling
- Maintenance & Support
- Outreach / Marketing

Popular misconceptions about Open Science

"Open Science must be free."

"Transfer via Open means no revenue."

Private customers and developers

Business clients

Popular misconceptions about Open Science

"Open Science must be free."

"Transfer via Open means no revenue."

"Free IP promotes societal use in every case."

Transfer and Open Science

Classical Transfer

Protect to exploit it as proprietary

- Legal protection
- Confidentiality
- Lock-in strategies
- Publication only when it causes no "harm"

Result

- Closed teams under legal restrictions
- Input from outside / community is difficult
- Occasionally high revenues for research

Open Science

Make knowledge widely accessible

- Publication (as much as possible, not only results, but also methods, data, etc.)
- Simplify usage, sometimes even for free

Result

- Possible boost for usage
- Sometimes lack of protection prevents exploitation (e.g., medications, large software providers, etc.)
- Revenue for research increases through new business models or dual licenses

Transfer and Open Science

Opportunities

- Transparency & traceability lead to higher perceived quality
- Involving users and communities unlocks potential for further development
- Easier access leads to faster and more transfer
- Debate between open and transfer leads to better structures and solutions
- New business models unlock new revenue streams

Risks

- Transfer & exploitation shift out of focus
- Misunderstood or wrongly applied open concepts damage later exploitation
- Different understandings of open lead to chaos and misunderstandings
- Key performance indicators are not adapted to open, making transfer less successful

Let's look at

- Data

- Hardware

- Infrastructure

Who owns data?

- Data and facts cannot be protected

- Databases can be protected:

  Structure is protected by copyright

Open Research Data

Open Data = FAIR Data

"Open Data is the practice of opening your data as unlimited as possible to as many people as possible. The best practice is to commit to the FAIR–principles when it comes to sharing data."
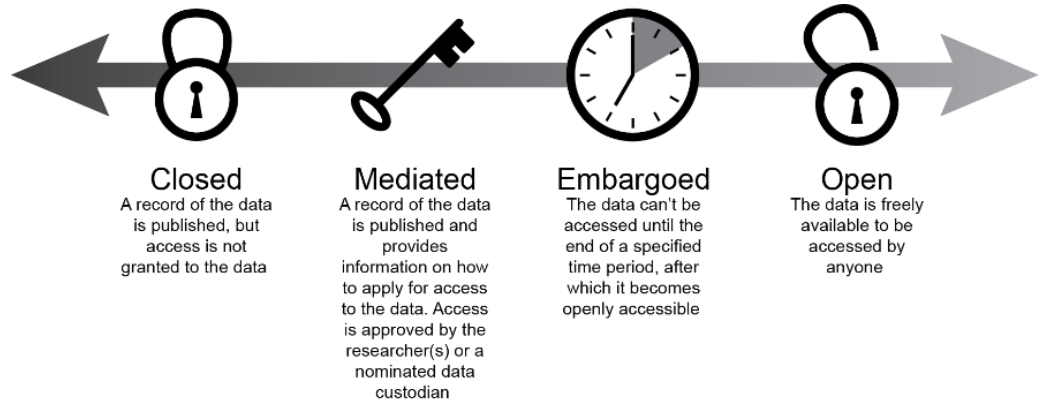
Open Research Data

Open Data = FAIR Data

"Open Data is the practice of opening your data as unlimited as possible to as many people as possible. The best practice is to commit to the FAIR– principles when it comes to sharing data."

Not necessarily free usage!

Possible publication of data:

Closed
A record of the data is published, but access is not granted to the data

Mediated
A record of the data is published and provides information on how to apply for access to the data. Access is approved by the researcher(s) or a nominated data custodian

Embargoed
The data can't be accessed until the end of a specified time period, after which it becomes openly accessible

Open
The data is freely available to be accessed by anyone

Open Data example:

OpenWeather

https://openweathermap.org/

Open Data example: OpenWeather

Business model

- **Freemium Model**: Basic weather data is free; premium features (minute-by-minute forecasts, historical data, …) are available through paid subscriptions.

- **Partnerships**: Customized weather data solutions for businesses, universities, and governments provided through subscriptions and licensing fees.

- **Licensing for Commercial Use**: Paid licensing packages for commercial applications (integration into mobility apps, media weather services, …)

Open Hardware example: Arduino

Arduino is an Italian **open-source** hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices.

https://www.arduino.cc/

Open Hardware example: Arduino

Open
- Hardware designs
- Software source code
- Documentation: assembly, user manual, …

Proprietary
- Hardware parts
- Trade Mark
- Some software
- Some products in collaboration

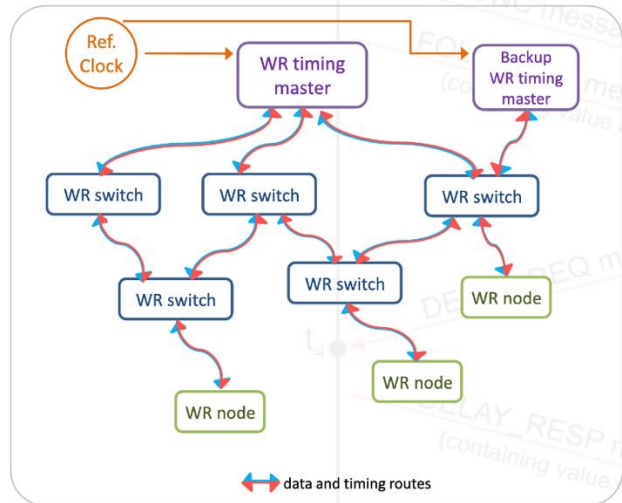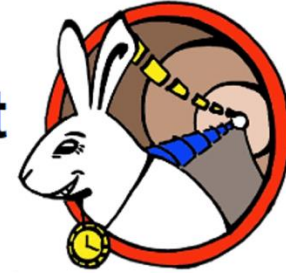https://www.arduino.cc/

Open Hardware example: Arduino

Revenue

- Genuine Arduino Boards (selling Hardware)
- Accessories, Kits, …
- Education / Training
- Online Services
- Licensing the name (Trade Mark)

https://www.arduino.cc/

Open Hardware example: White Rabbit

Revenue model:

- **Certification and related Trademark**
- **Consultancy and training**
- **Partnership / Membership**

https://white-rabbit.web.cern.ch/

Open Hardware example

Entity Type	Size/sub-type	Annual Fee (CHF)
Companies	Large	50,000
	Medium	25,000
	Small	15,000
Public	National Metrology Institute, National Laboratory, Research Institute	15,000
	University	10,000

https://www.white-rabbit.tech

Infrastructure Green IT Cube

Gabi Otto, GSI

Gabi Otto, GSI

Digital Open Lab

Status quo					
Floor 1	Floor 2	Floor 3	Floor 4	Floor 5	Floor 6
		Digital Open Lab: R&D projects with industry		FAIR GSI	FAIR GSI

Gabi Otto, GSI
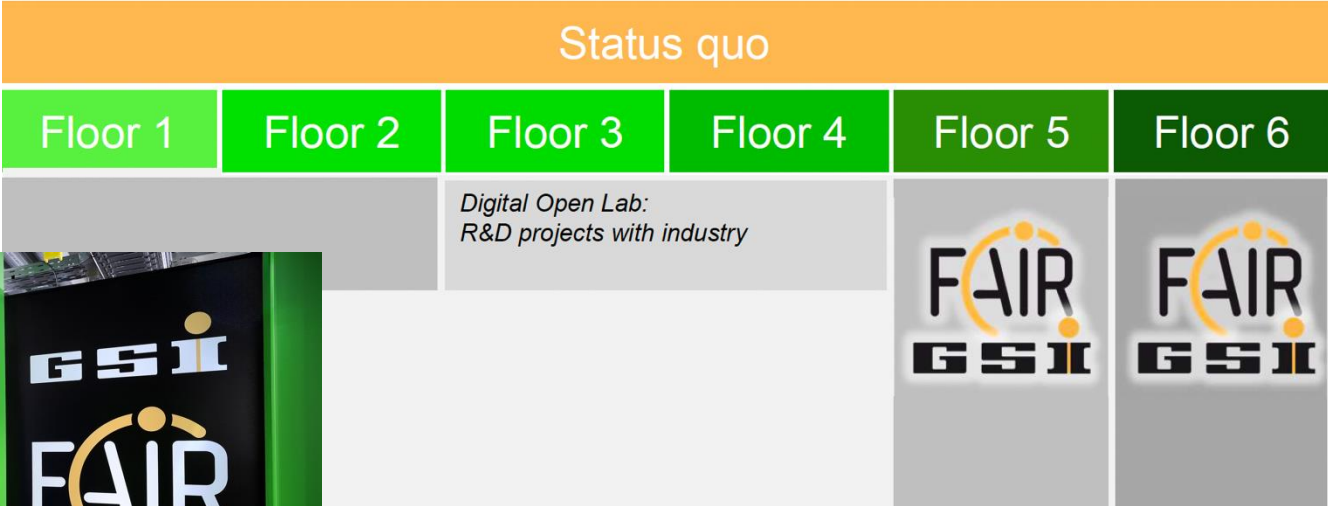
Digital Open Lab

Offer to private and public partners:

Joint R&D: Offer to provide the infrastructure and IT competences of GSI and FAIR for joint development around the topics of HPC, Big Data and ultra-fast data acquisition, including software developments and products

Collaborations: Access to HPC systems and projects for external partners via collaboration projects

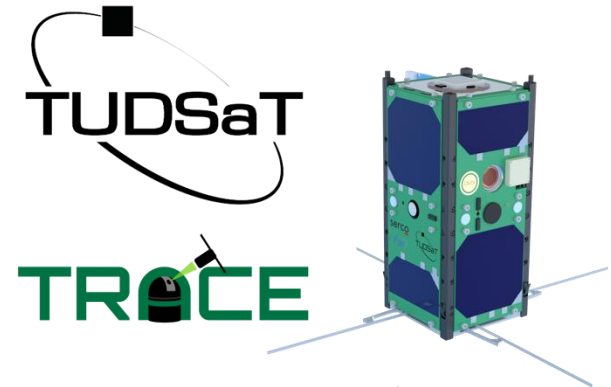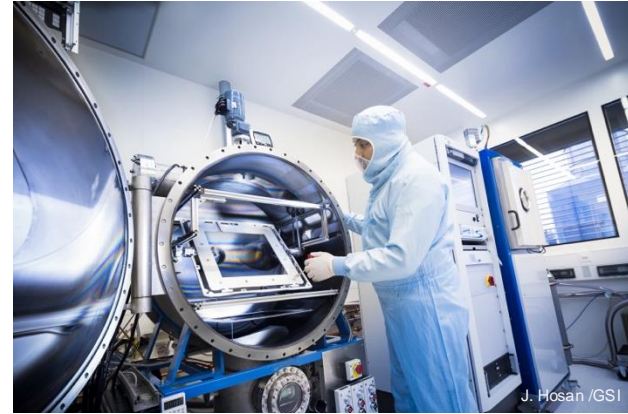**Provision of rack space:** via research cooperation in the data center

Open Lab

J. Hosan /GSI

Started: Open Detector Lab

- Detector lab with clean room

- First cooperation:

  TU Darmstadt Space Technology e.V. (TUDSaT)

  (+ electronics developed @ GSI)

www.tudsat.space

Open Revenue models

- Selling the product (+ add-ons)
- Selling warranty and support
- Software / Data / Hardware as a service
- Renting out Trademark
- Selling Certification (related Trademark)
- Consultancy and training
- Contract R&D
- Partnership / Membership
- Sponsorship / donation
- State money for strategic Open R&D

How to financially sustain your Open source project?

OpenTransfer

Methods to enable and improve transfer of knowledge and technologies in the context of Open Science

➡️ Financing business models for transfer

➡️ Tools for concrete and easy support

➡️ Development and implementation of organizational structures and processes

➡️ Consultancy and educational materials

What now…?

- Think about a possible utilisation of your work.

- Think about (non-)disclosure of your work.

- Check the guidelines at your institute.

- Talk to your Tech Transfer Office for support.

- Consider an industry network and entrepreneurship for your career path.