



Timo Christian

DESY Start-up Office (Future Innovators)

Quantum Universe Days 2025 | 19 February 2025

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**INNOVATION &
TECHNOLOGIE
TRANSFER** —

 **Future Innovators**
A Helmholtz Transfer Academy

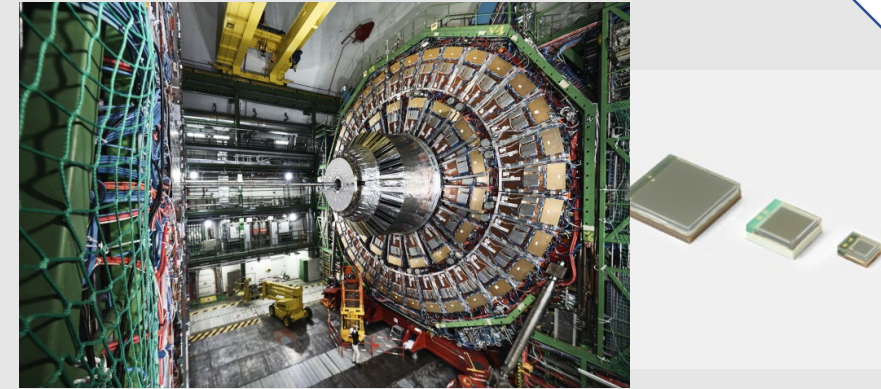
DESY. *for Start-Ups*



Background

Timo Christian (DESY)
timo.christian@desy.de
timo.christian@future-innovators.de

Background:
Particle Physics
Masterthesis at the FTX group
(HGCAL) SiPMs for
Hi Lumi CMS Endcap Calorimeter
+
DESY Guide
Science Communication



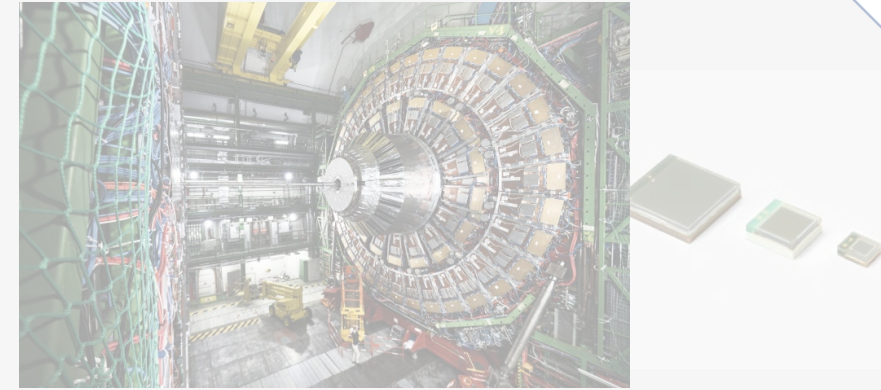
Source: CERN images

Source: hamamatsu.com

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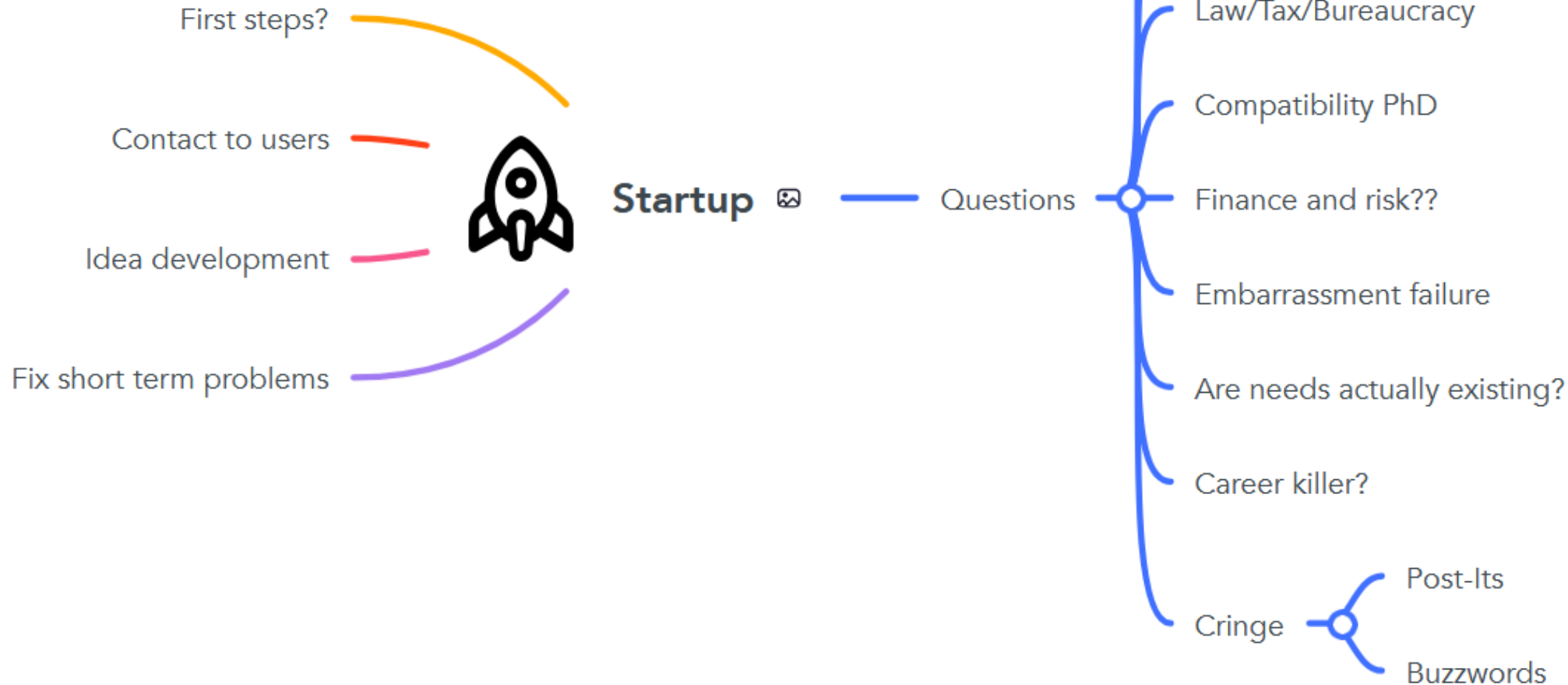
Impressions about the last 1.5 years.

Spoiler: I think it is fantastic. I want to share why and I want to tell you what we offer to support you.

—
INNOVATION &
TECHNOLOGIE
TRANSFER —



When I started working for the Start-up Office:



Innovation at DESY

1) Science and Innovation/Application

- 1) Similarities and Differences

2) Example of the Start-up: WiredSense

3) DESY Start-up Office:

- 1) Future Innovators
- 2) Start-up Office Support: Pre-Founder to Start-up

4) Innovation infrastructure on the Campus

The Potential that I see

On campus:

- Great scientific techs and developments for scientific questions.
- We have PhDs and Postdocs who carry that knowledge:
 - A) Continue in academia and continue to develop new knowledge
 - B) Who will leave academia in a few years, looking for other scientific career paths
- We already have a very active ecosystem, with over 30 start-ups on campus.

Overall:

- Tons of modern-world challenges.
- Pressing, short-term global crises
- Responsibility to search for problems that we can solve already.

The Potential that I see

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Pressing, short-term global crises

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My wishlist:

- 1) I want to keep as much knowledge on the campus as possible.
- 2) Let people know how valuable their abilities are and how many opportunities exist to apply them.
- 3) Establish methods to pinpoint concrete needs in broad problems and connect knowledge.
- 4) Create as much benefit as possible from investments in science.
- 5) Further boost self-determined scientific careers.

Scientific and Innovation/Application

The similarities and differences in **my opinion**

Similarities: Motivation!

It's about deeply understanding problems.
Finding solutions to solve that problem.

Differences: in processes!

Scientific, especially fundamental research:

Detailed understanding of everything that is going on. You need to exactly understand what you are doing and be as precise as possible because you are solving new problems.

Application of innovation:

You fix the existing problems **of others**. Precisely understand the problem and its environment. Pinpoint the exactly where you can apply the lever.

You should use the first part of a solution as soon as you have it. A sanity check is often enough to start using it. Details come only with experience.

Pioneer and melting point for start-ups

Locational advantage: knowledge and access (currently 35 Start-ups)



Detector and sensor technologies



Laser-based technologies



Life Sciences, Biotech



Accelerator-based technologies



Data Science



Materials science



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Detector and sensor technologies



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Data Science



Materials science



iovo|gmbh



ximul.it



Noisy Labs



Cybersec-dms



DNABIOS



Highlight innovation to application: Wired Sense



Beginning:
Development of IR-detectors at
MPI for Structure and Dynamics of Matter

Supported by



(Went through our programs)

DESY. *for Start-Ups*



Pyroelectric detector MPY-RS2

The MPY-RS2 is our fastest and most sensitive detector. The standard version has an electronic 3dB cut-off frequency at 8kHz and enables the direct measurement of signals up to 100 kHz. Like all pyroelectric detectors it is especially suited for measurements in the long-wave infrared (LWIR) and THz range. The increased performance compared to the MPY-RS detector results from...

Content 1 pieces



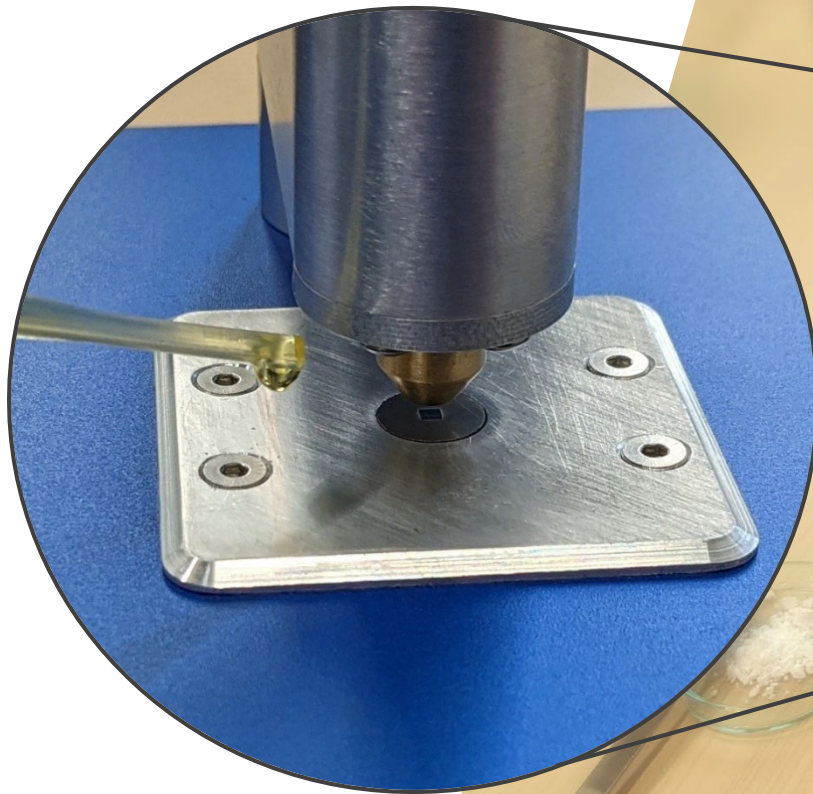
Pyroelectric detector MPY-RS

The MPY-RS is a fast and highly sensitive detector for measurements of various radiation sources. This further improved version of the proven MPY-01 detector enables the direct measurement of signals up to 5 kHz thanks to optimized amplifier electronics. Therefore, for pulsed light sources no chopper is necessary up to this frequency. At the same time, the extremely high...

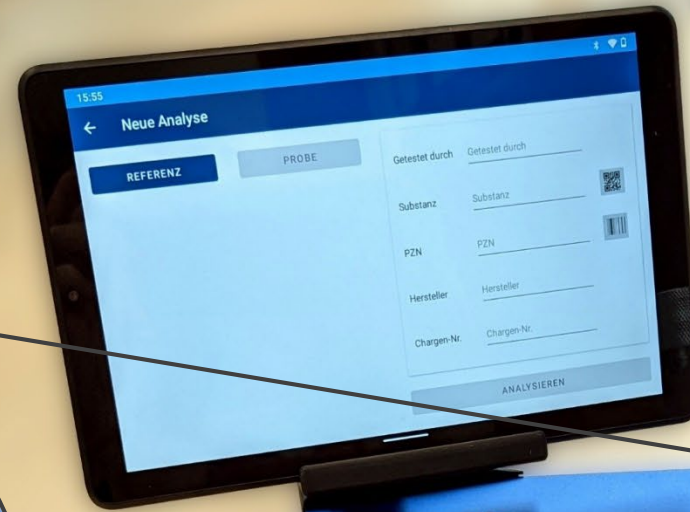
Content 1 pieces

Sweeb

IR-Spectroscopy Platform



Diamond
sampling surface



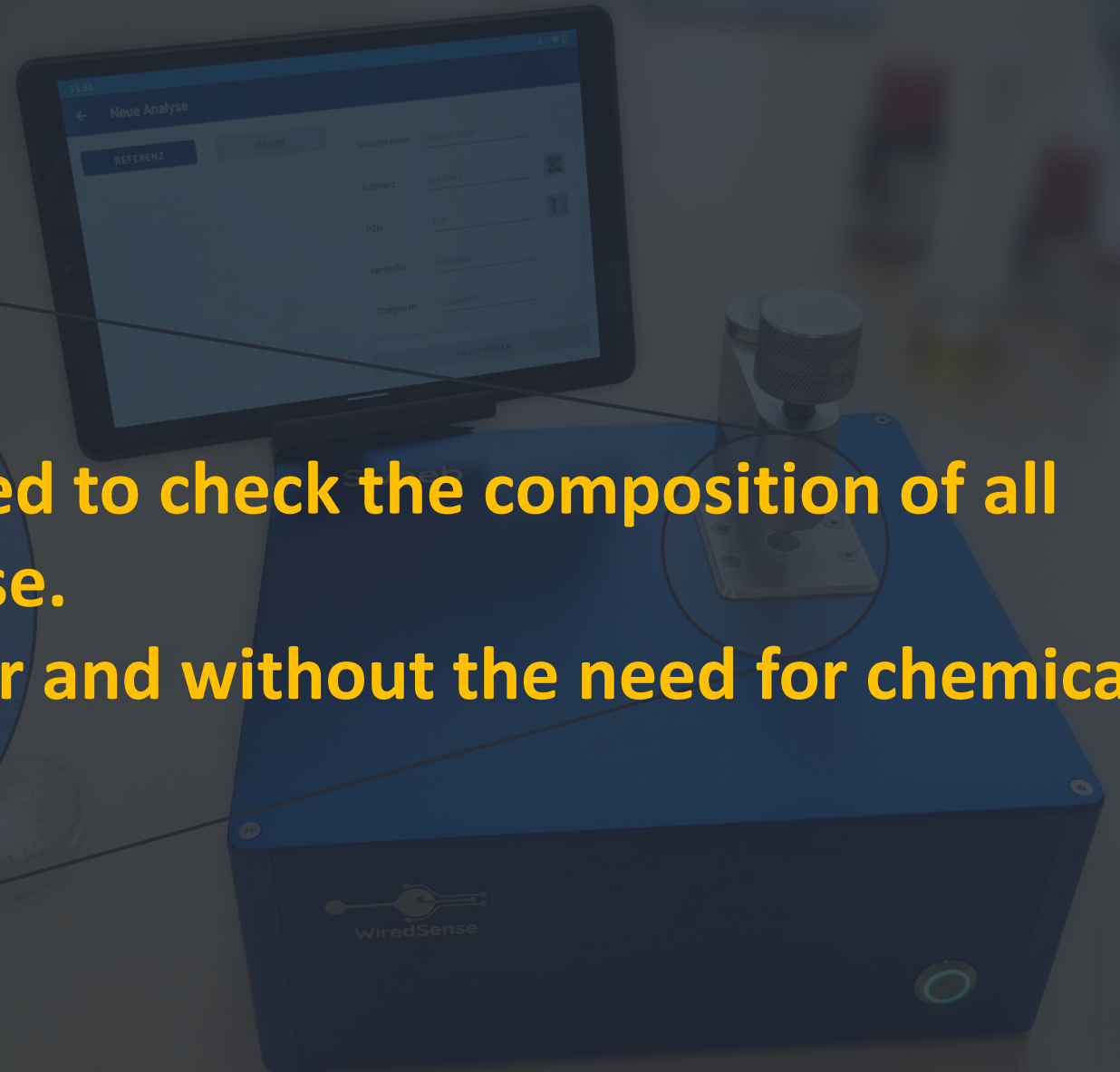
Sweeb

IR-Spectroscopy Platform

**Pharmacies are legally mandated to check the composition of all medicines they prepare in-house.
We help you do this faster, safer and without the need for chemicals.**

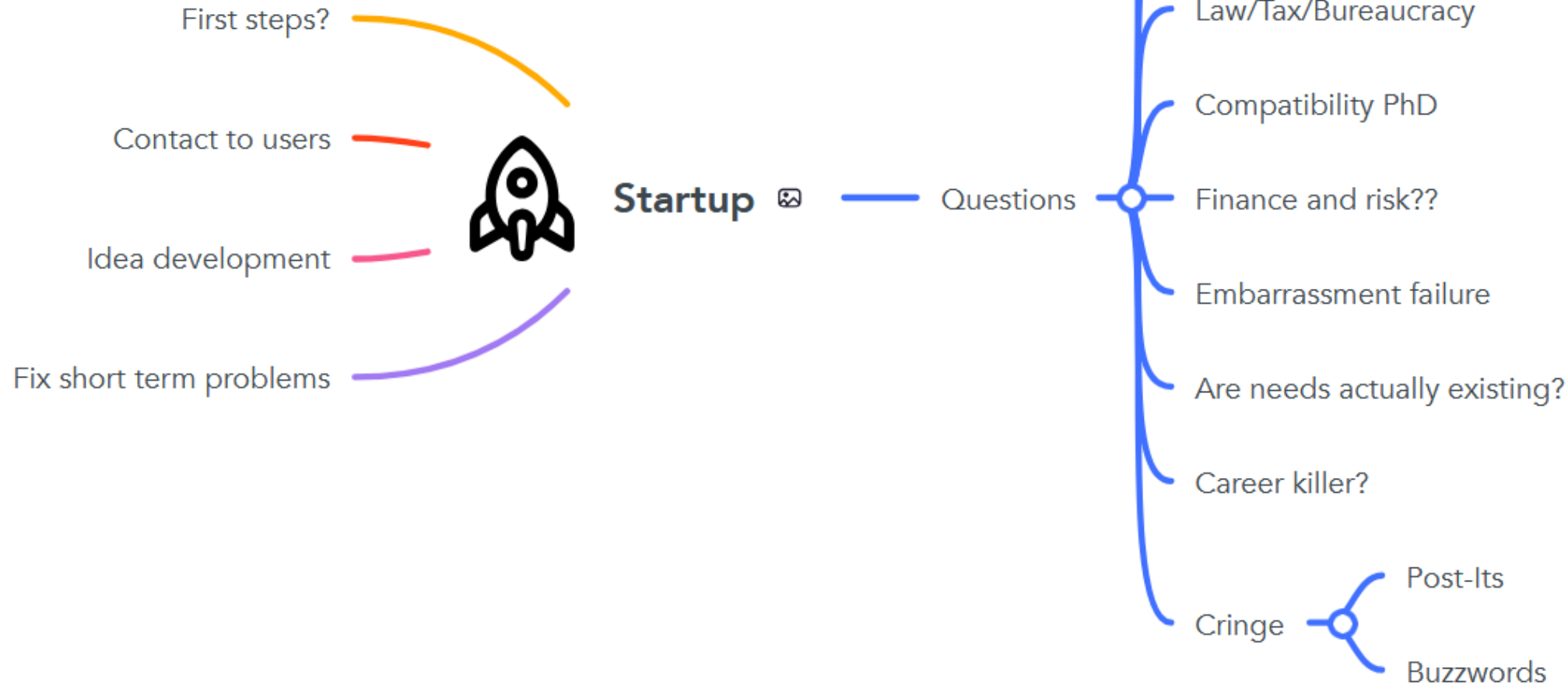
<https://www.wiredsense.com/page/sweeb>

Diamond
sampling surface

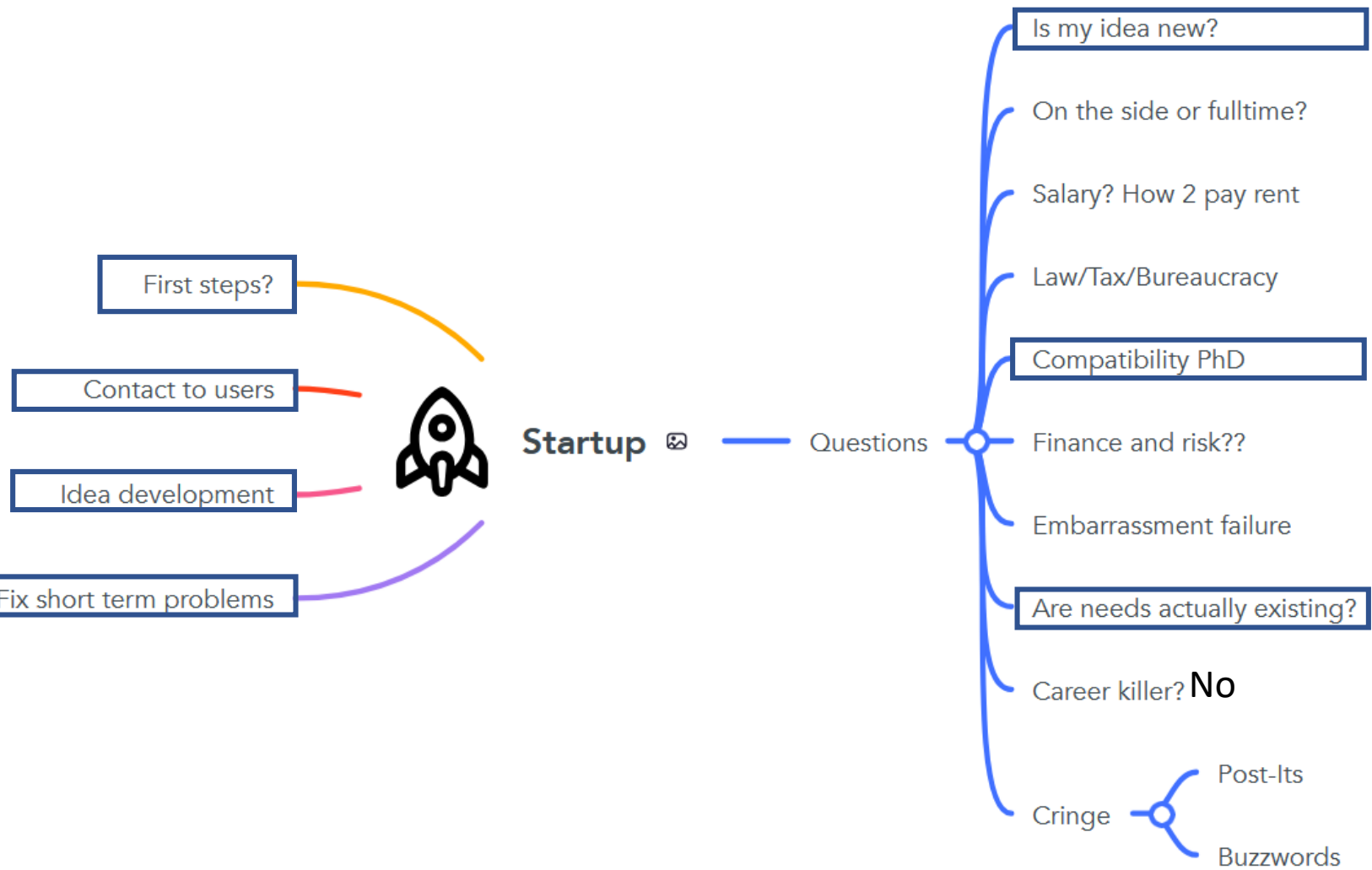


Milestones

WHEN I STARTED WORKING FOR THE START-UP OFFICE:



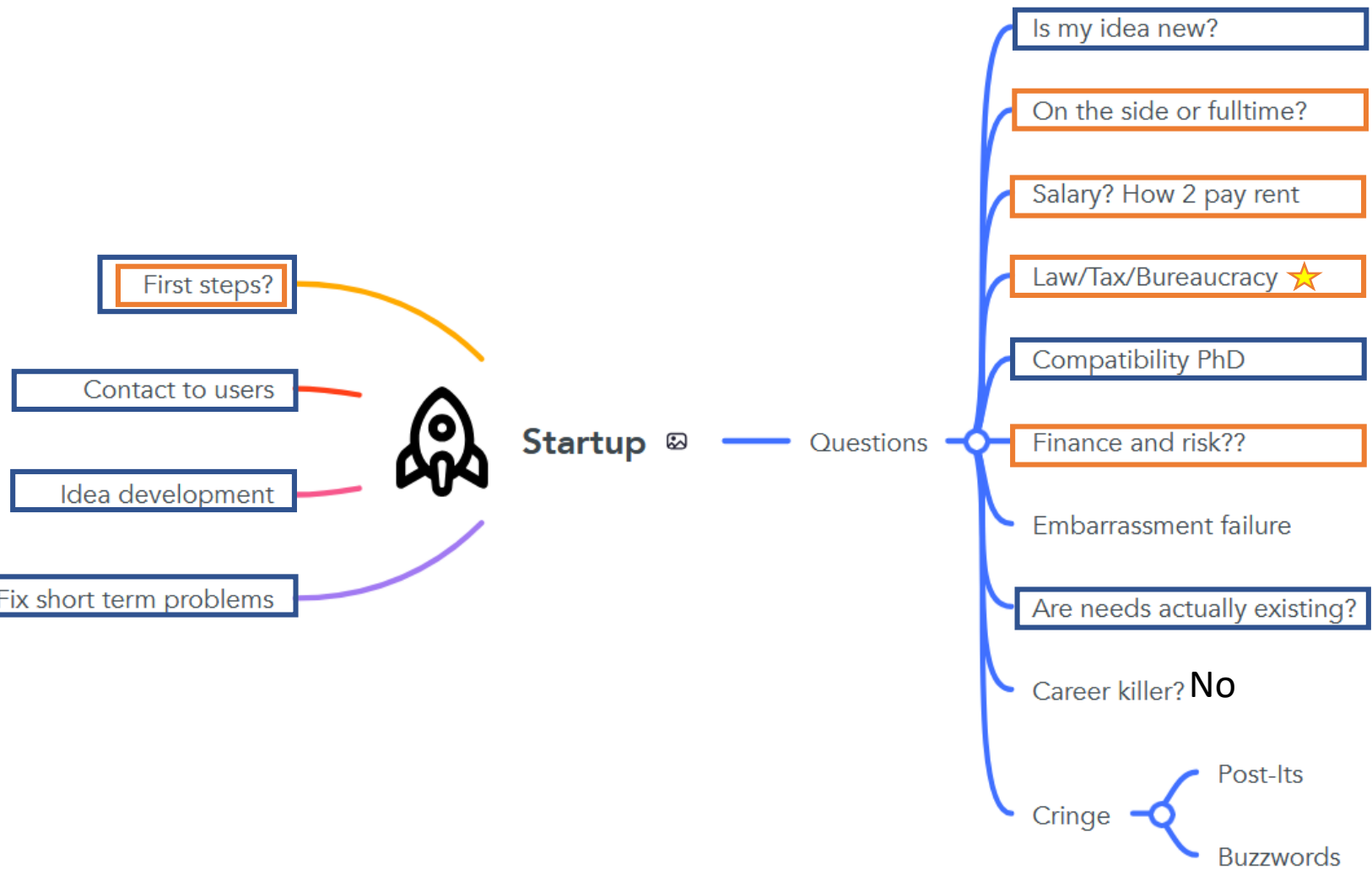
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DESY. *for Start-Ups*



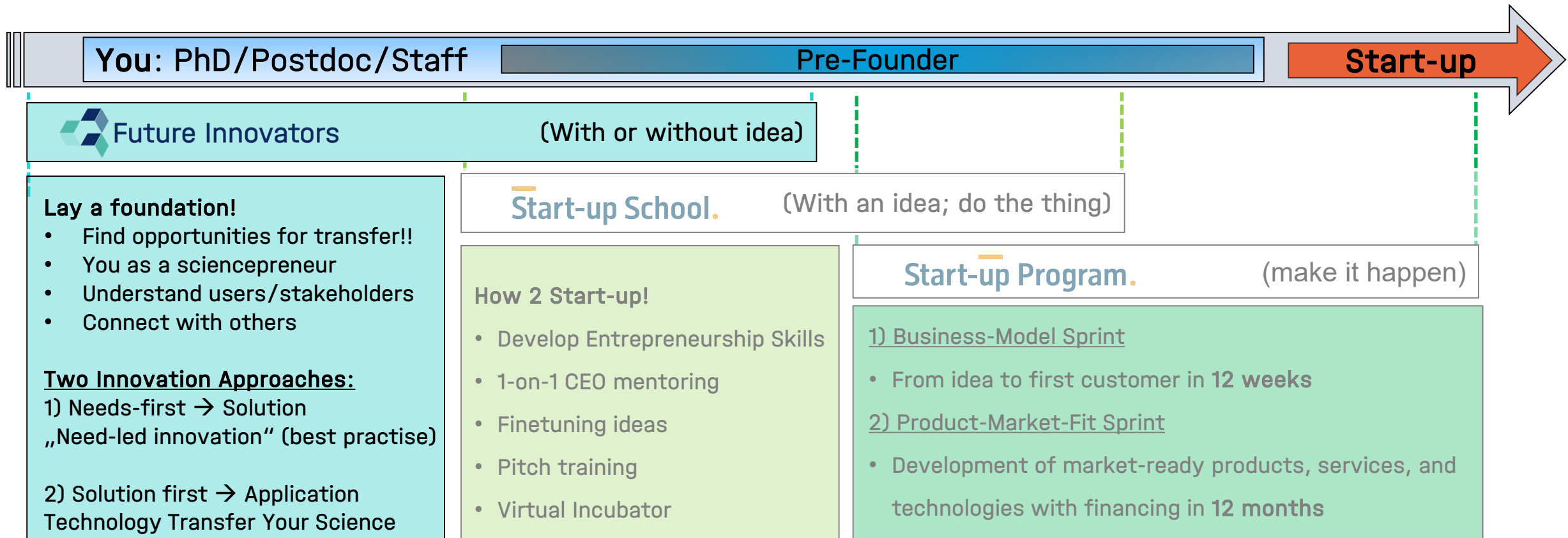
WHEN I STARTED WORKING FOR THE START-UP OFFICE:



★ We provide vouchers for first law consultancy, we dont have lawyers in the Start-up Office



DESY Start-up Office: support the creation of science start-ups



Limitation at the moment: Helmholtz associates
(contact me, there might be options in the summer)

(Everything is free of charge)



Future Innovators

A Helmholtz Transfer Academy

Learn. Connect. Elevate.

HELMHOLTZ





Future Innovators

A Helmholtz Transfer Academy

Hightech Design Sprint

(1-week BOOTCAMP)

MARKET PULL

NEED

(MARKET)

SOLUTION

(TECH)

Application Discovery

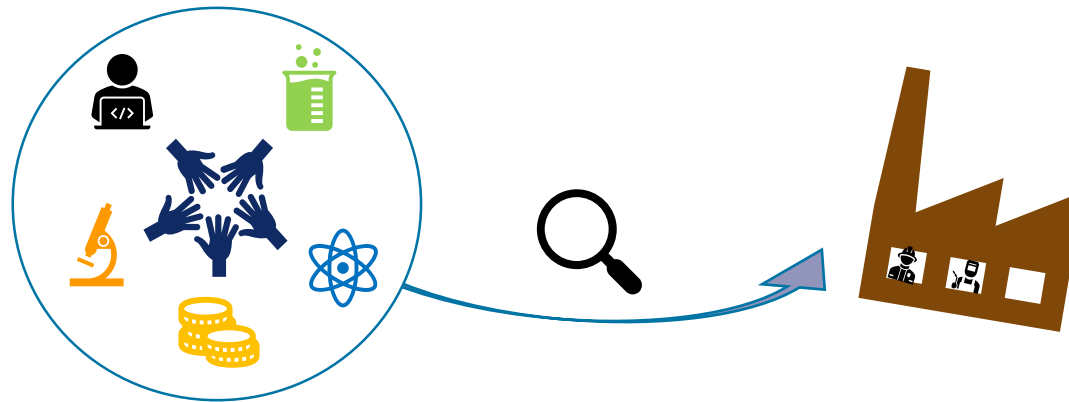
(2-day workshop)

TECH PUSH

Future Innovators „Hightech Design Sprint“:

Problem → Solution

Need-Led Innovation Bootcamp



IDENTIFY INVENT IMPLEMENT

Steinway&Sons February 2024



Ford-Werke GmbH August 2024





Future Innovators

A Helmholtz Transfer Academy

Forrest

Cross
atlantic

Completely
processes

good

bad

Resonanceboard

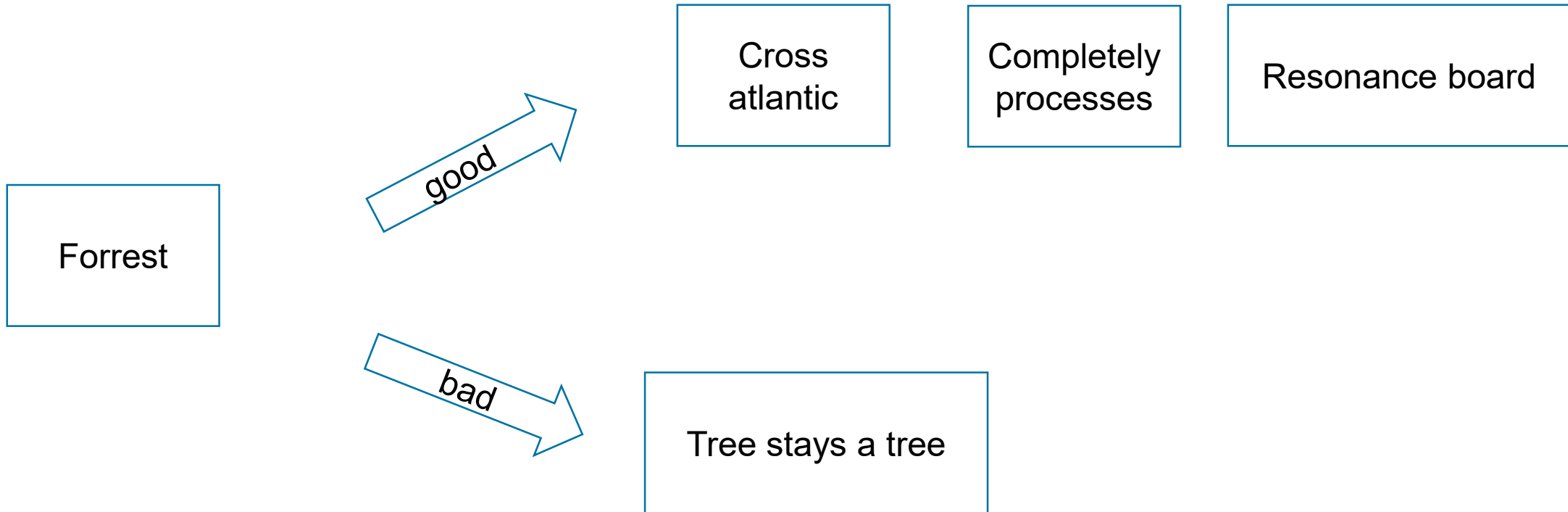


Future Innovators HDS: Steinway & Sons



Future Innovators

A Helmholtz Transfer Academy



Future Innovators HDS: Steinway & Sons

HIGHTECH DESIGN SPRINT:

Need → Solution

Future Innovators 1: Steinway&Sons

„We need a way to address the unknown quality of the wood in wood suppliers & high-end wood manufacturers that reduces wood waste drastically.” ~Team 3

→ Solution concept: scanning trees with electric waves to reduce wood waste and cross ocean transportation.

„There is the need for an easy process to report minor injuries and near-misses to identify potential hazards to prevent major accidents.” ~ Team 5, incl. me 😊

→ Proof-of-Concept: install buttons on work benches.

Future Innovators 2: Ford-Werke GmbH

„We need a way for people in hot and noisy environments to communicate that is as convenient as wearing regular headphones/earplugs reducing the time lost by miscommunication.” ~Team Marie Saleh

→ Solution considerations: Macro noise-canceling or cooled, easy to clean head gear

Hightech Design Sprint ... goes **DINOSAUR**

Host for observations:



SCAN and learn more!



Photo: (c)_Hwa Ja-Götz_MfN

Travel expenses are covered by Future Innovators (for DESY participants)

March 3-7 @DESY in Zeuthen
5 days | in English | in person

HELMHOLTZ





Future Innovators

A Helmholtz Transfer Academy

Hightech Design Sprint
(1-week BOOTCAMP)

MARKET PULL

NEED

(MARKET)

SOLUTION

(TECH)

Application Discovery

(2-day workshop)

TECH PUSH



Future Innovators „Application Discovery“

Problem ← Solution

Technology seeks application

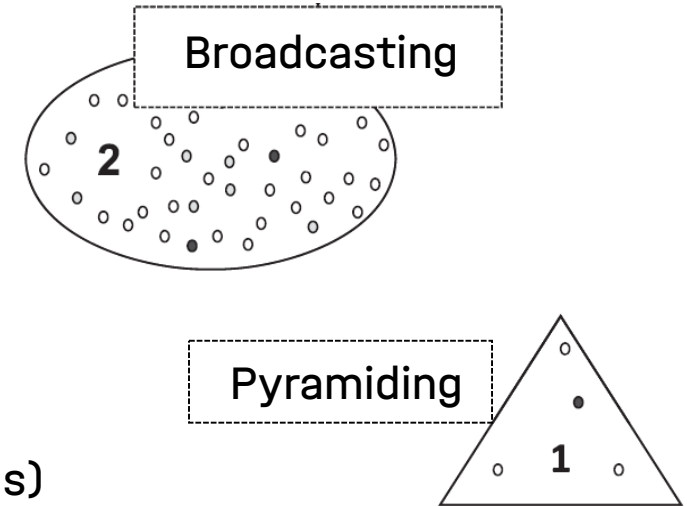
Technological Competence Leveraging (TCL) Methode:

- 1) Technology analysis from the user-perspective (Search for unintended features)
- 2) Active search for application with new features (Broadcasting and Pyramiding)
- 3) How to evaluate an application or technology

Format: 1-day workshop, in-person - Prof. Keinz der WU Vienna

- Work on case-study or your own technology (requires self-preperation)

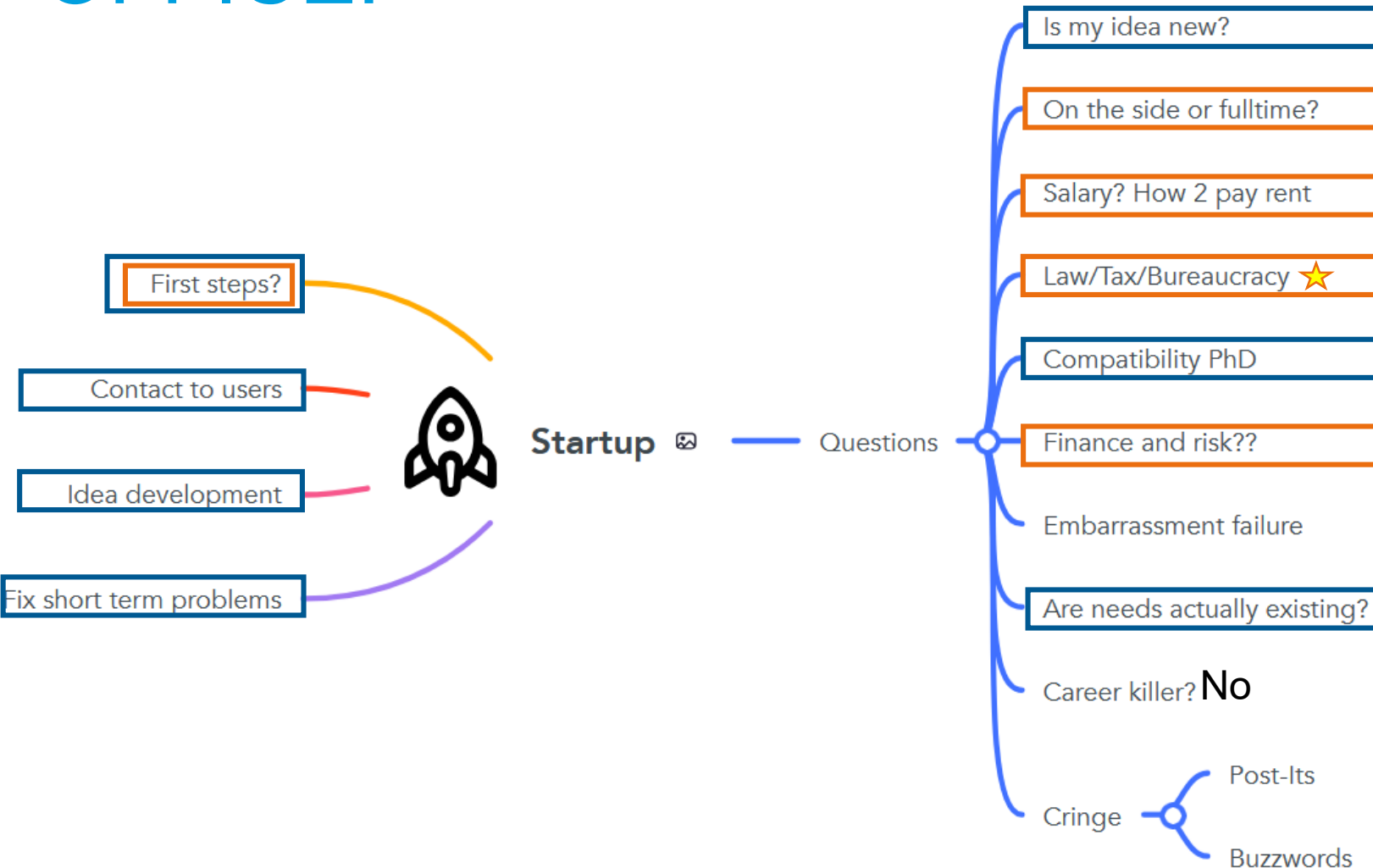
Exploit user-communities:



HELMHOLTZ



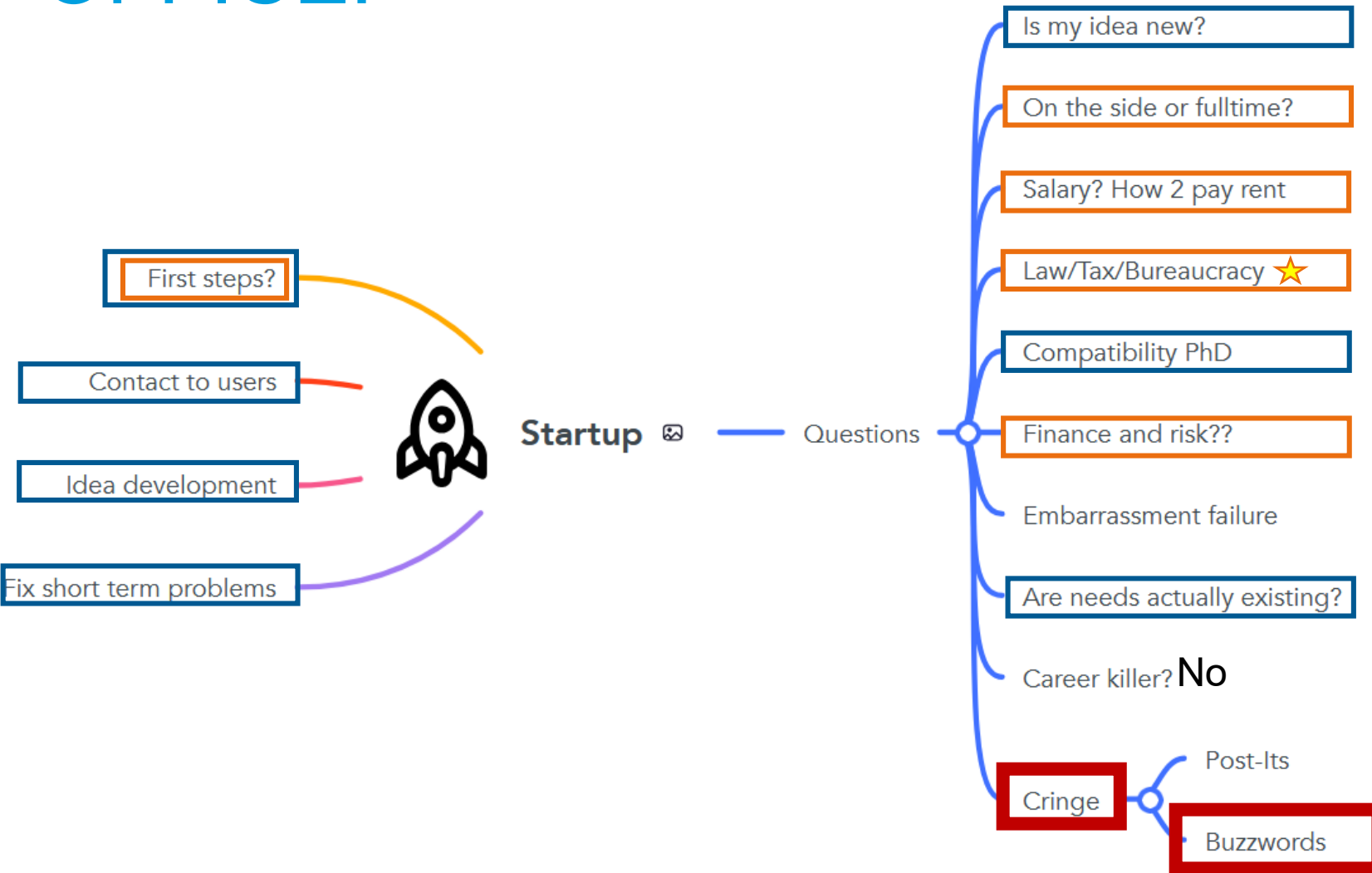
WHEN I STARTED WORKING FOR THE START-UP OFFICE:



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CRINGE BUZZWORDS

Is my idea new?

On the side or fulltime?

Salary? How 2 pay rent

Law/Tax/Bureaucracy ★

Compatibility PhD

Finance and risk??

Embarrassment failure

Are needs actually existing?

Career killer? No

MINDSET CHANGE

Cringe

Post-Its

Buzzwords

Market Pull, Tech Push
Entrepreneur
Entrepreneurial superpower
Sciencepreneur
Incubator
Makerspace
Pitch Training
Business Model Canvas
Design Thinking
Disruptive Innovation



Challenges deeptech and life science

- Deep tech is defined as innovation with cutting edge science with the opportunity for massive change or “disruption”
- Creating deeptech innovations is resource intensive.
- Regulatory requirements and high upfront costs of research and development.
- High personal investment, necessary to convince others to be able to realise it.
- **Deep tech can influence and change whole sectors when we hit a sweet spot of a market pull, boundary conditions like regulations , and relevant resources.**

The DESY Start-Up Office Team

How to contact us



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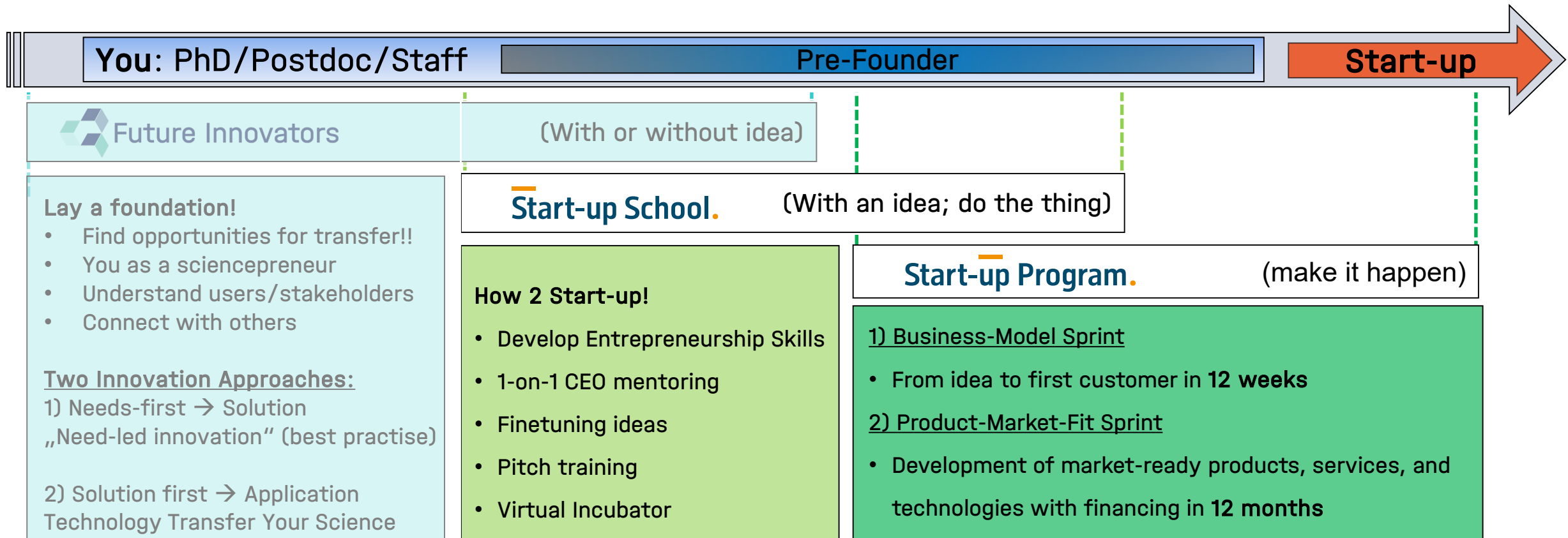


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Future Innovators*

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DESY Start-up Office: support the creation of science start-ups



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(Everything is free of charge)

Support at the Start-up Office

1:1 Consultancy



Ideation



Business Modell



Financing



Founding



Start-up/Scale-up



FINANCING YOUR BUSINESS

Examples of grant programs

—
INNOVATION &
TECHNOLOGY
TRANSFER —



IFB
HAMBURG |



AI.STARTUP.HUB

HELMHOLTZ RESEARCH FOR
GRAND CHALLENGES

eXIST
Existenzgründungen
aus der Wissenschaft

Gefördert durch:



Bundesministerium
für Wirtschaft
und Klimaschutz

aufgrund eines Beschlusses
des Deutschen Bundestages

- **DESY Generator Program**
- **ifb InnoRamp Up & Innofounder (HH)**
- **AI Startup Hub (HH)**
- **Helmholtz Enterprise**
- **Exist Gründerstipendium / Forschungstransfer**

Hamburg start-up ecosystem

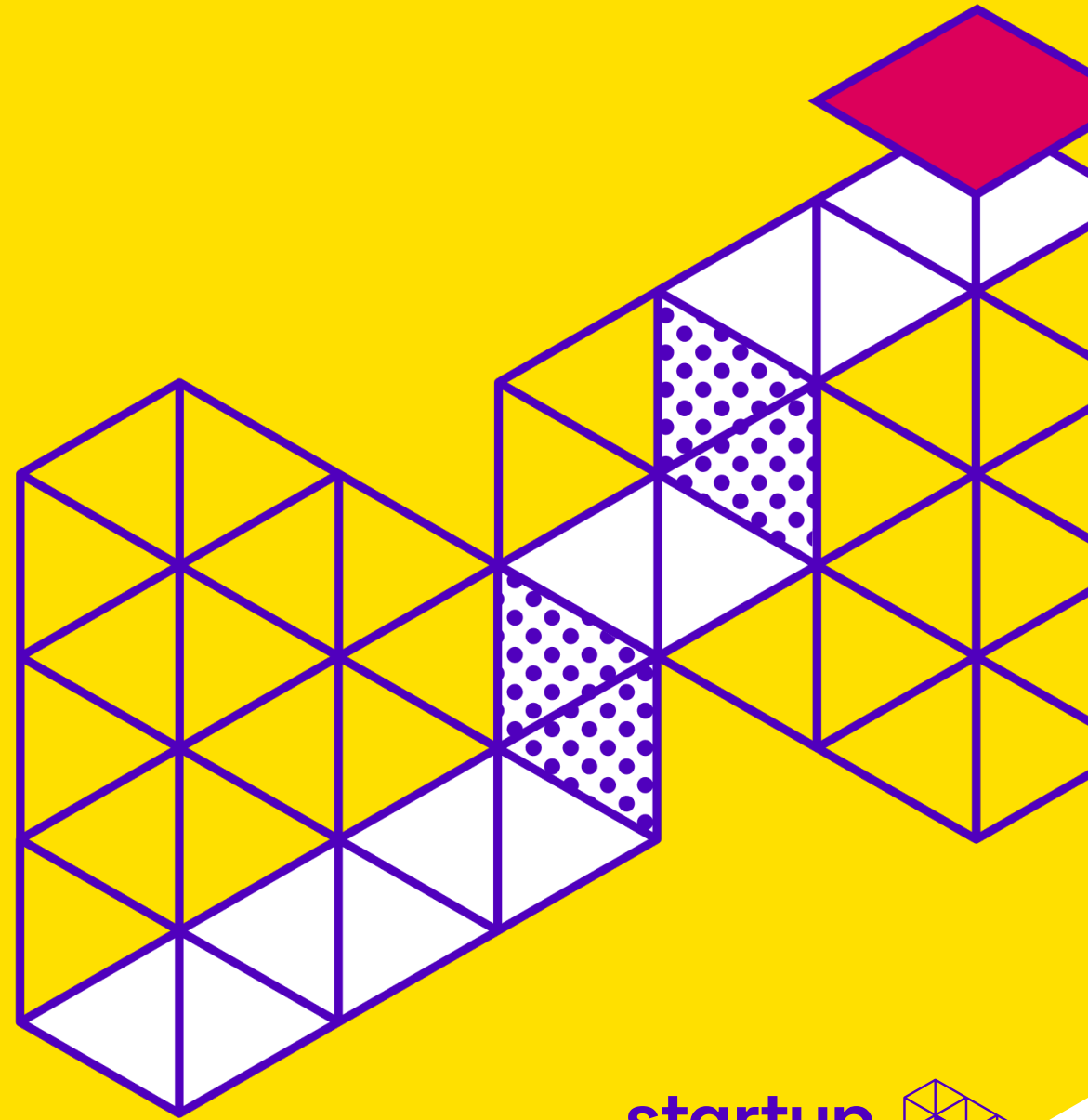
Access to a broad network of support in Hamburg



Startup Port

Wir sind Mitglied im großen Verbund!

- ▶ Mehr als 10.000 Forscher*innen & 80.000 Studierende tragen dazu bei, dass die Metropolregion Hamburg für Innovation & Forschung steht.









startup
port








Start-up spirit @ DESY

Nurturing an ecosystem



DESY Technology / Know How	
	Femto second laser systems
	Femto second lasers & modules for laser synchronisation
	X-ray and electron detectors
	High-precision instruments for research at synchrotrons
ximul.it	Simulations for the semiconductor industry
	Service-provider for X-ray fluorescence imaging at synchrotrons
	App development digital health












Consultation	
	Pyroelectrical radiation detectors
	Tailored solutions for the manipulation of Synchrotron X-ray radiation
Noisy Labs	Device and component construction
	Bio-Nanotechnology Products
	Vacuum Systems
holy	Production of carbon fibre components
Episteme99	Software tools for high-throughput precision imaging
	Technology platform for drug discovery
zilentix	Lentiviral vectors for <i>in vivo</i> applications
science. as a service.	Science project management & consulting






Hosted by











Tenants: Start-up Labs

	3D Cell Culture Robot
	Protein crystallography, service for drug discovery
	3D printing IaaS platform
	Genetic medicine platform for drug development
	Building of operational quantum computers
	3D-Print solutions & consulting
	Auto alignment of laser in science
	Development of semiconductor and micromechanics technologies, systems for scientific research
	Services for muscle X-ray diffraction

Tenants: Innovation Village

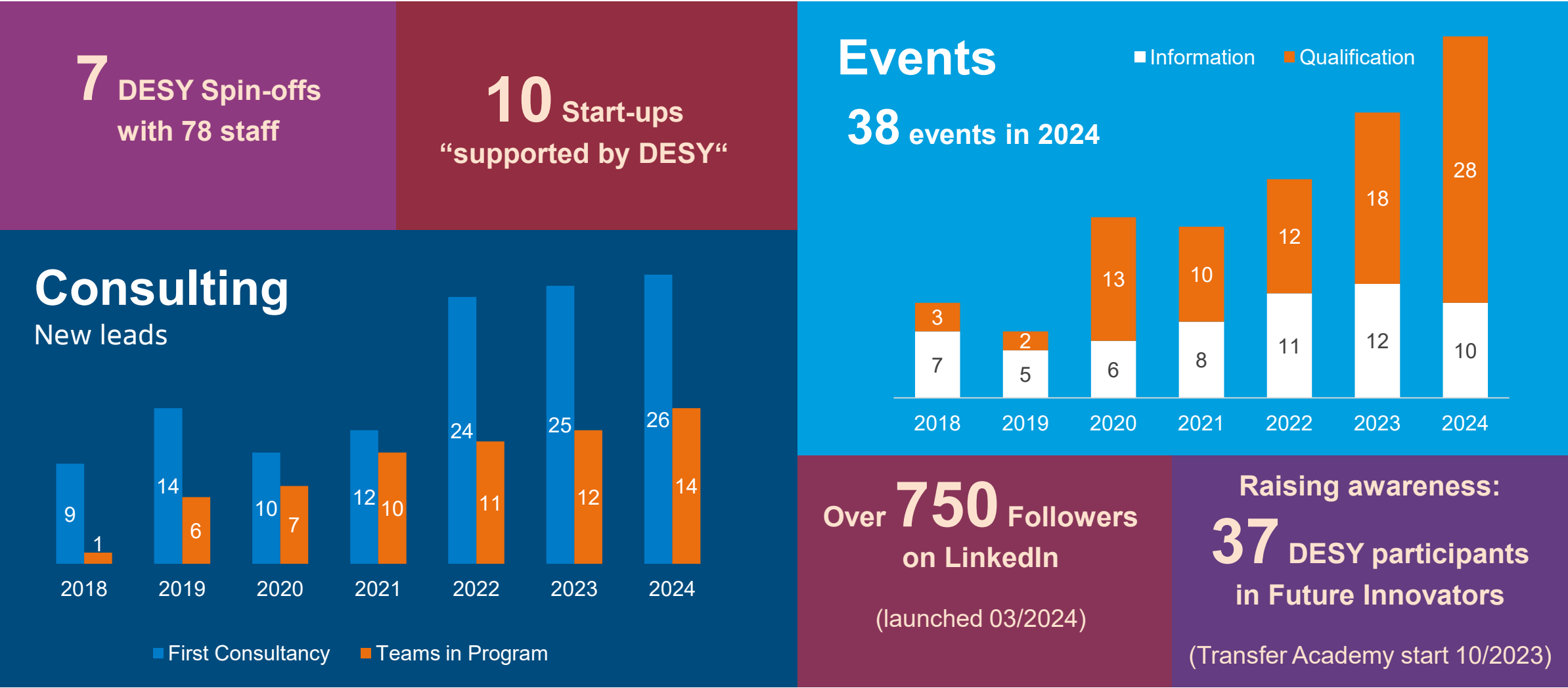
	Radiofrequency experts for innovative and high quality RF Coaxial cables, connectors, components
	Web-based SaaS hospital system
	Synchrotron X-ray powder diffraction and advanced materials characterization
	Development of biotechnology in the field of therapeutics for autoimmune diseases
	Development and commercialization of highly innovative unmanned aerial vehicles

Tenants: tecHHub

	Protein crystallography, service for drug discovery
	Innovative cancer monitoring via Liquid Biopsy
	Gene Therapy for curing HIV
	Theranostic Discovery with nanobodies
	Experimentation with droplet-based biotech and superior surfactants
	Artificial intelligence designs
	Quantum computers
	Biochar carbon removal

Growing support for pre-founders

Performance and Outreach Start-up Office STO



Developing your idea



- Great innovation potential in research
- Inspiring collaboration of interdisciplinary teams
- Generate business ideas at online workshops
- Hightech Design Sprint
- Open to Helmholtz Associates

Founders Toolbox

- Online Workshop Series
- Methods, Tools
- From brainstorming to business model development and further financing

Conceptualizing the business model

Start-up School.

- Basic Training to develop Entrepreneurship Skills
- 1-on-1 CEO mentoring
- Finetuning ideas
- Online Webinars

Start-up Program.

- **Business-Model Module**
- From idea to first customer in **12 weeks**
- Product-Solution-Fit
- In person at DESY Campus

Individual Consultation

Launching the business idea

Start-up Program.

- **Product-Market-Fit Module**
- Development of market-ready products, services, and technologies with financing in **12 months**
- Product-Market-Fit Method
- In person at DESY Campus

Entrepreneurship Lunches

Onsite Workspace Opportunities

Helping you connect with:

**People interested in founding
+ Assistance with funding solutions
Experienced founders**

Companies in the industry

People with specialized knowledge

Construction of the Innovation ecosystem



techHHub
3.500 m²
(9/2024)



Innovation Factory II
@ Innovation Park Altona
2.700 m² (Schedule: 2027)



Start-up Labs
Hamburg
3.600 m² (7/2021)



DESY Innovation Village
(Makerspace)
600 m² (2/2019)



Innovation Factory I on
Campus
5.300 m² (Schedule: 2027)



DESY Innovation Village

First infrastructure for deeptech founders



- first project of the innovation infrastructure
- originally as a provisional facility
- Office space and small laboratory/workshop space approx. 600 sq. m.
- Opening Feb. 2019
- Currently almost fully occupied (2nd generation)

Start-up Labs Bahrenfeld

Adequate infrastructure for deeptech founders

Who?

- Operating company: Start-up Labs Hamburg GmbH
- 44% DESY, 30% FHH, 26% UHH

Where?

- Luruper Hauptstraße / Stadionstraße
- Transition between campus and outside

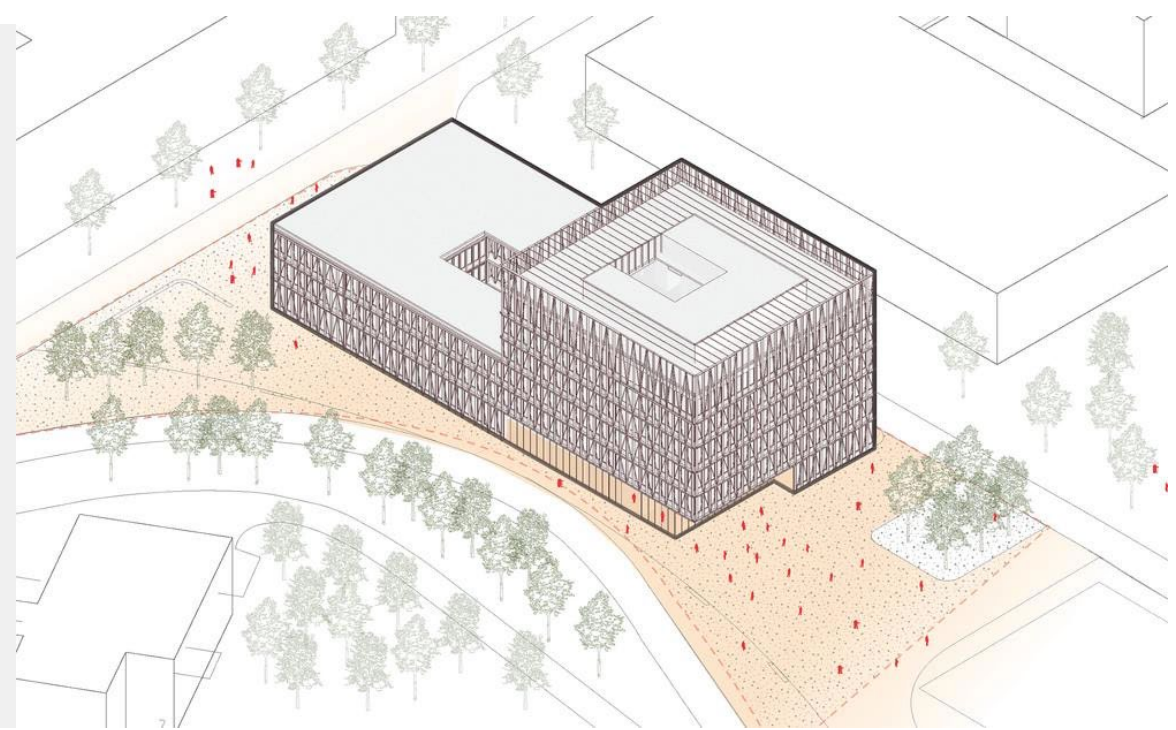
What?

- ca. 2.200 m² Rental space, office and laboratory/workshop in equal parts
- ca. 500 m² Meeting rooms, event and social spaces
- Total: 3.600 m²



DESY Innovation Factory Campus

- > Transferprojekte, Vorgründer, Start-ups, Scale-Ups, Industrie/KMUs (R&D Einheiten, Kooperationsprojekte mit Start-ups oder DESY)
- > Auf ca. 7.000 m² Netto-Nutzfläche: Nass-, Chemie und optische Labore, offene Werkstätten für Elektronik, Mechanik & Prototyping sowie Büroräume & Co-Working Flächen.



DESY Innovation Factory Vorhornweg

- > Platz für wachsende und etablierte Hightech Unternehmen der Bereiche Photonik, Detektoren und Werkstofftechnik
- > Auf ca. 3.500 m² Netto-Nutzfläche Labor- und Werkstattflächen, flexible Büro- und Meetingräume sowie großzügige Konferenz- und Eventräume (im Innovationspark Altona)

DESY Innovation Factory I

Innovation Factory close to science

FOR?

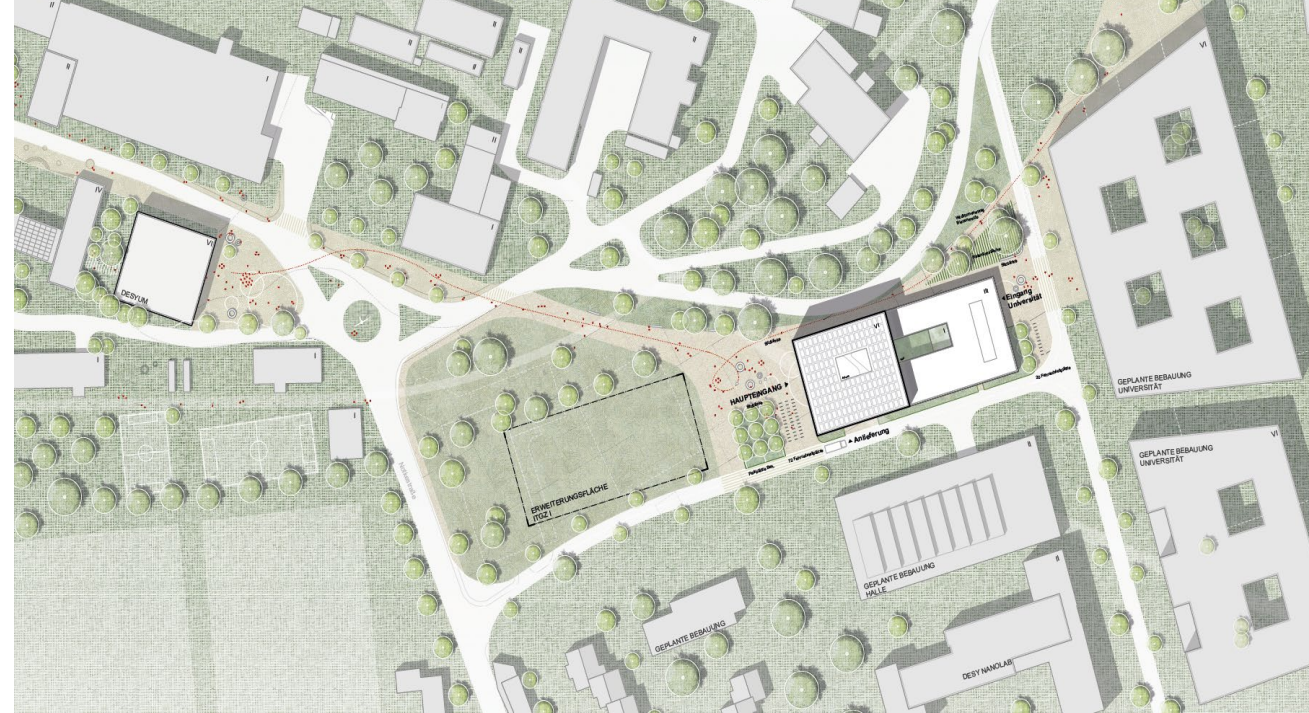
- Central space for innovationen on the campus: start-ups, pre-founders, applied science, industry cooperations, etc.

WHERE?

- central on the DESY-Campus between the university and DESYUM

WHAT?

- ca. 5.300 m² usable space, offices, labs and mechanics
- Fully equipped rooms
- Construction until: 2027



DESY Innovation Factory II

Innovation Factory towards market

FOR?

- Scaling space for deeptech companies in materials, photonics, electronics, detectors, etc.
- By DESY

WHERE?

- Innovationspark Altona
- More space for expansion with a building in the south

WHAT?

- ausbaubare physics laboratories, electric/mechanics
- approx 2.700 m² usable space
- flexible office and meeting space
- Construction until: 2027



Want to catch up with the latest **Start-up News from DESY?**



Stay informed about events, news and funding opportunities for start-ups on campus. Sign up to the **DESY Start-up Office Newsletter!**



Follow us on **LinkedIn** for regular insights into our events, workshops, and selected info on programs held by our partners.

Backup

Our institutional foundation – a skilled team

50 % former industry affiliation



tecHHub

Pionierbebauung am Vorhornweg

WER?

- Wachsende Hightech-Unternehmen der Bereiche Medizin-, Biotechnik, etabliert am Markt
- Betreiber: tecHHub GmbH und Co. KG (städt. Tochtergesellschaft)

WO?

- Erster Baustein im Innovationspark
- Schaffung eines sichtbaren Orts für innovative Unternehmen

WAS?

- ca. 3.500 m² Nutzfläche mit ausbaubaren Nasslaborflächen inkl. notwendiger Anschlüsse
- flexible Büro- und Meetingräume
- Eröffnet am September 2024



Pioneer and melting point for start-ups

Locational advantage: knowledge and access

Detection and sequencing of cancer DNA from blood

Cure for HIV



Detector- and Sensor Technologies



Laser Technologies

Laser synchronisation for big research infrastructure.
F. Kärtner



Life Sciences, Biotech



PiNa-Tec
Bio-Nanotechnologie



Accelerator Based Technologies



Data Science



ximul.it



Material Sciences / 3D-Printing



holy

Carbon fibers!
New approach,
which makes them
reusable!



Noisy Labs

Service-provider for X-ray
fluorescence imaging at
synchrotrons

Very fast simulation of chip design!