UK DEEP TECH DELEGATION
March, 28th

Western Switzerland Digital Cluster promoting digital technologies and connecting digital players and Swiss industries

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western
switzerland
digital
cluster

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Activities

inform + **connect** + **boost**

inform	connect	boost
Digital Tech insights	Tech Demo	Collaborations
Entrepreneur interviews	Linking the ecosystem	
Relevant Digital Tech Events	Event : The Shapers	
Studies & reports		

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DeepTech in Switzerland

What are Deep Tech technologies ?

Blockchain

Blockchain infrastructure (scaling solutions, cryptography, cold storage)

Distributed computing

Future of Computing

Quantum (computing, cryptography, communication, etc)
Silicon Photonics
AR/VR/MR
Brain-computer interfaces

Neuromorphic & advanced AI chips
Quantum chemistry and AI for chemical and biotech fields

Novel AI

Generative AI
AI-first biology
Privacy-preserving AI
Explainable AI
AI acceleration
Autonomous driving
General purpose AI

AI-first biology

Biotech*

Synthetic biology

FoodTech & Agritech (cultivated meat, modified crops)
Bio-fuels & bio-chemicals
DNA synthesis
Health (tissue printing & diagnostic)

Advanced materials

CO2 negative materials
Bio-plastics
Synthetic diamonds
Graphene

Autonomous driving

Transportation

Urban air mobility & eVTOL
Hydrogen/electric aviation
Hyperloop

Robotics

Collaborative robotics

EV batteries

Novel Energy

Nuclear fusion
Next-gen lithium batteries
Large-scale storage
Green hydrogen
Supercapacitors
Waste heat recovery

Space Tech

Reusable and next-gen rockets
Satellites for communication & earth observation
In-space transportation
In-space manufacturing
Debris removal

Cybersecurity

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Source: Dealroom.co
*Biotech is excluded by this definition of Deep Tech, except for some segments such as AI-first biology

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DeepTech clusters in Europe

+ **Switzerland in the heart of Europe's Deep Tech clusters**

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Key takeaways in Europe

+ Deep Tech in Europe has grown strongly and has shown resilience in recent market turmoil

European Deep Tech startups raised $17.7B in 2022, 22% less than 2021 total, but still +60% on 2020.

Looking at Q3 & Q4 2022, Deep Tech was the 2nd best performing segment behind only Energy year on year.

LPs in Europe see Deep Tech as the 2nd most promising segment in venture capital.
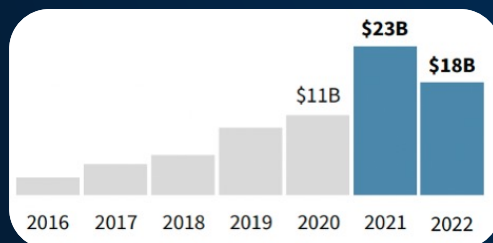
+ Key emerging areas in Deep Tech have changed

By its own nature, Deep Tech is constantly evolving. Some segments mature to the scaling and mainstream phases, while new ones emerge to push the boundaries of what is possible.

Four core emerging segments of Novel AI, Future of Computing, Novel Energy and Space Tech raised $4.4B in 2022, their highest total ever and double that of 2020.

+ Requirements to accelerate European Deep Tech

Europe has great technical talent and research to lead in Deep Tech. Many European Deep Tech successes have their roots in academia, spinout processes and unrealised potential of European universities can still be unlocked.

Four core emerging segments of Novel AI, Future of Computing, Novel Energy and Space Tech raised $4.4B in 2022, their highest total ever and double that of 2020.

VC investment in European Deep Tech startups

Year	Value
2020	$11B
2021	$23B
2022	$18B

VC investment in core emerging Deep Tech segments in Europe (2022)

Segment	Value
Novel Energy	$1.6B
Novel AI	$1.1B
Future of Computing	$0.9B
Space Tech	$0.7B

Unlocking potential of academic spinouts

Bridging the gap between early stage dedicated Deep Tech investors and generalist

Gender inclusion is still in the early innings

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European Deep Tech startups capital raised

Venture capital investment in European Deep Tech startups

Selected Deep Tech rounds in 2022

Startup	Funding round	Focus
climeworks	$600M Series F	Direct air carbon capture and storage
EXOTEC	$335M Series D	Industrial robotics
newcleo	€300M Early VC	Nuclear fission
IQM	€128M Series A	Quantum computing
ICEYE	$136M Series D	Earth observation satellites
stability.ai	$101M Series A	Generative AI

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European Deep Tech investment

Europe is far behind the United States in terms of investment in deep technologies, but still ahead of China.
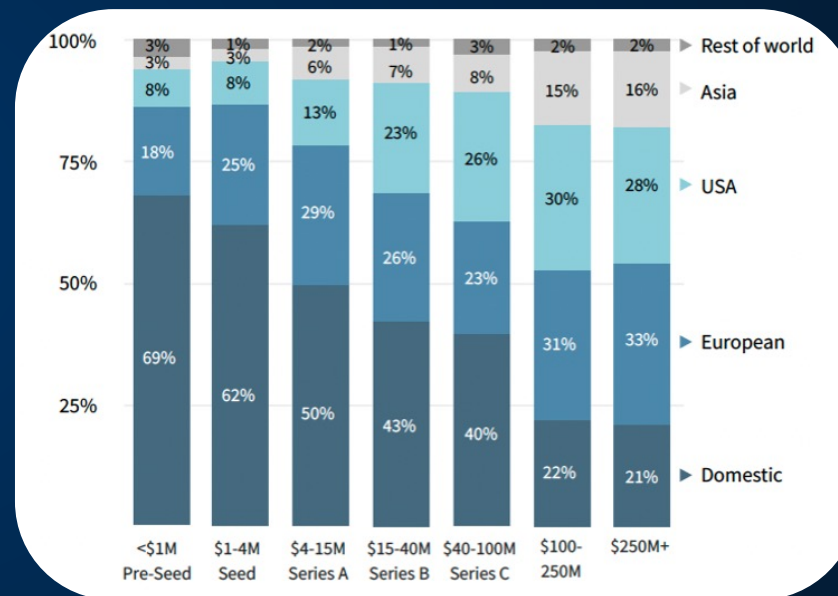
Deep Tech is key for European sovereignty and security.

More is needed if Europe wants to be the third pole and have control over critical technologies and enablers

Global VC investment in Deep Tech by startup HQ (2020-2022)

US	$166B
Europe	$52B
China*	$34B
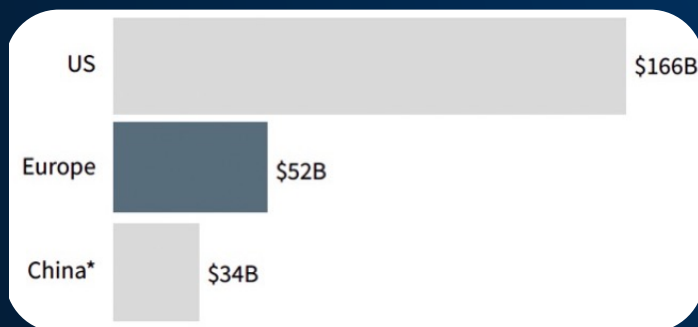
The share of funding coming from US and Asia for European Deep Tech increases to nearly 50% at late stage

	<$1M Pre-Seed	$1-4M Seed	$4-15M Series A	$15-40M Series B	$40-100M Series C	$100-250M	$250M+	
Rest of world	3%	1%	2%	1%	3%	2%	2%	
Asia	3%	3%	6%	7%	8%	15%	16%	
USA	8%	8%	13%	23%	26%	30%	28%	
European	18%	25%	29%	26%	23%	31%	33%	
Domestic	69%	62%	50%	43%	40%	22%	21%	

Source: Dealroom.co, LakeStar, WaklenCatalyst
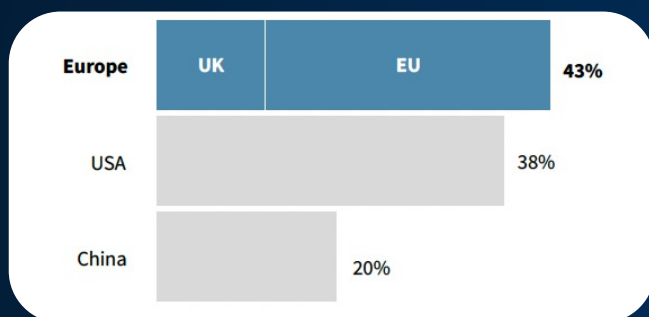
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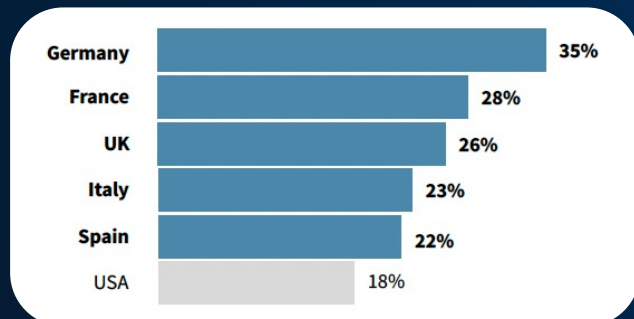enovating

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European research in Europe and Switzerland

Europe has the great technical talent and research leadership required to play a key role in the future of global Deep Tech.

High share of highly-cited research publications

Europe	UK / EU	43%
USA		38%
China		20%

Europe excels in Computer Science ranking (THE 2022)

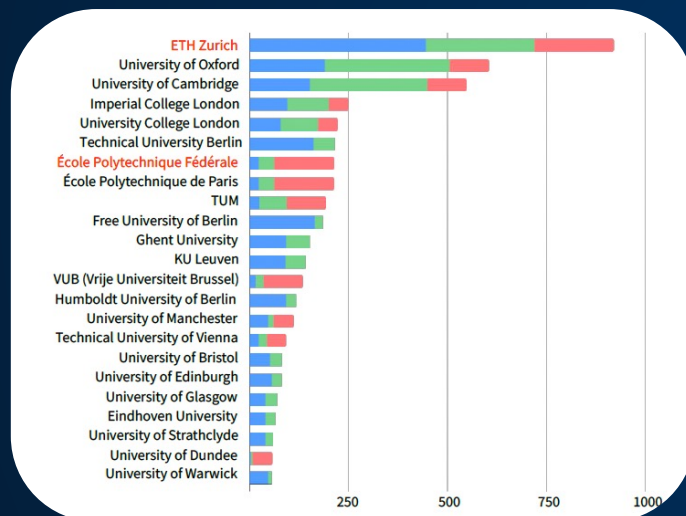|			
1.	Oxford	11.	Imperial College London
2.	Stanford	12.	UCLA
3.	MIT	13.	Tsinghua (Beijing)
4.	ETH Zurich	14.	Caltech
4.	Cambridge	15.	TU Munich
6.	CMU	16.	Singapore Nanyang
7.	Harvard	17.	University of Washington
8.	Berkeley	18.	Cornell
8.	National University of Singapore	19.	Peking university
10.	Princeton	20.	École polytechnique fédérale de Lausanne

European students are more into science
(portion of graduates in Science, Technology, Engineering, and Mathematics)

Germany	35%
France	28%
UK	26%
Italy	23%
Spain	22%
USA	18%

... and does well also in Engineering ranking (THE 2022)

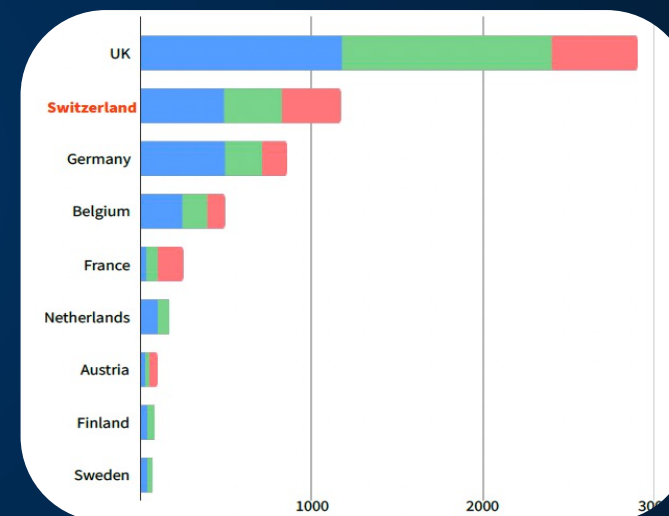|			
1.	Harvard	11.	University of California
2.	Stanford	12.	Peking university
3.	Berkeley	13.	Imperial College London
4.	MIT	14.	Georgia Tech
5.	Cambridge	15.	Singapore Nanyang
6.	Oxford	16.	Yale
7.	Princeton	17.	Tsinghua (Beijing)
8.	Caltech	18.	Carnegie Mellon University
9.	ETH Zurich	19.	École polytechnique fédérale de Lausanne
10.	National University of Singapore	20.	University of Michigan-Ann Arbor

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Universities in the UK and Switzerland created the most spinout value

European universities which created most spinout value

ETH Zurich
University of Oxford
University of Cambridge
Imperial College London
University College London
Technical University Berlin
École Polytechnique Fédérale
École Polytechnique de Paris
TUM
Free University of Berlin
Ghent University
KU Leuven
VUB (Vrije Universiteit Brussel)
Humboldt University of Berlin
University of Manchester
Technical University of Vienna
University of Bristol
University of Edinburgh
University of Glasgow
Eindhoven University
University of Strathclyde
University of Dundee
University of Warwick

250   500   750   1000

University spinout value created by universities' country

UK
Switzerland
Germany
Belgium
France
Netherlands
Austria
Finland
Sweden

1000   2000   300

■ Total number of spinouts (1 point)   ■ Total number of spinouts that raised series A (5 points)   ■ Total number of spinouts with unicorn valuation (50 points)

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Largest Deep Tech ecosystem in Europe

UK, Germany, France Sweden and Switzerland are the largest Deep Tech ecosystems in Europe.

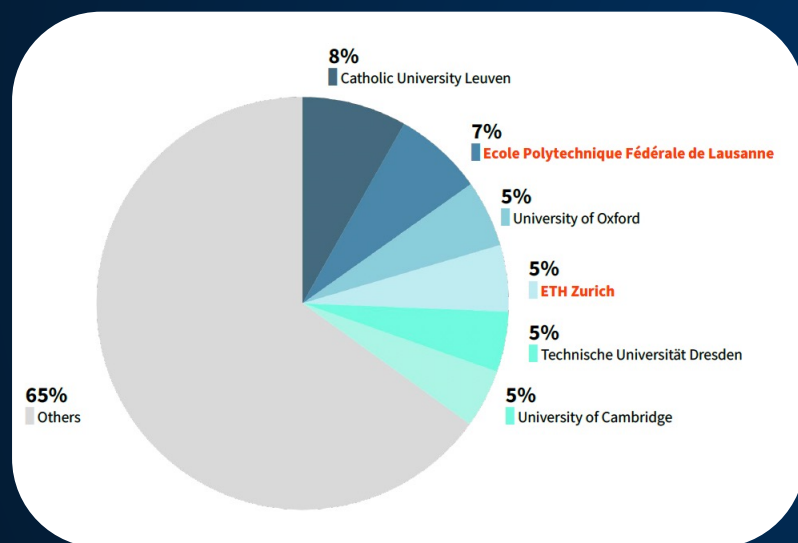Switzerland, Sweden, Finland and Norway are the most Deep Tech focused ecosystems.

Country	Value	%	Institutions
UK	$28.7B	21%	Oxford-Culham-Harwell-Abingdon, Cambridge, Bristol, Dundee, Warwick, Southampton, Edinburgh, London*
Germany	$12.8B	21%	Berlin, TU Munich, Fraunhofer, KIT, RWTH Aachen University, Uni Mainz, Darmstadt University of Technology, Ulm, German Aerospace Center
France	$9.8B	18%	Paris, CEA (Atomic Energy Commission), Vision Institute, LNE-SYRTE, LP2N, Grenoble Institute of Technology, Inria, Sorbonne (incl. ISIR)
Sweden	$8.5B	33%	Lund, KTH Royal Institute of Technology, Luleå University of Technology, Uppsala, Karolinska Institute, Chalmers
Switzerland	$6.7	35%	ETH Zurich, Swiss Federal Institute of Technology Lausanne, EPFL, IDSIA, UZH
Netherlands	$3.2B	18%	Eindhoven/Brainport-ASML-NXP-Philips, Delft, Wageningen, TNO, University of Amsterdam, Twente
Finland	$2.4B	32%	VTT, Aalto, Oulu, University of Helsinki
Spain	$2.2B	15%	Starlab, Polytechnic University of Catalonia (incl. ICFO)
Norway	$1.7B	27%	NTNU
Ireland	$1.1B	11%	Limerick, Dublin
Belgium	$1.0B	16%	Ghent, Leuven-Imec, Hasselt, Antwerp, UCLouvain, Vrije Universiteit Brussel
Denmark	$1.0B	14%	Odense, University of Copenhagen, SDU
Italy	$744M	13%	Politecnico Milano, Politecnico Torino, University of Milan, IIT
Austria	$517M	13%	Tu Wien, University of Applied Sciences Technikum Wien
Poland	$489M	24%	Warsaw University of Technology, Wroclaw University of Science and Technology, Polish Center for Technology Development
Portugal	$338M	23%	University of Porto, University of Lisbon, Universidade NOVA de Lisboa

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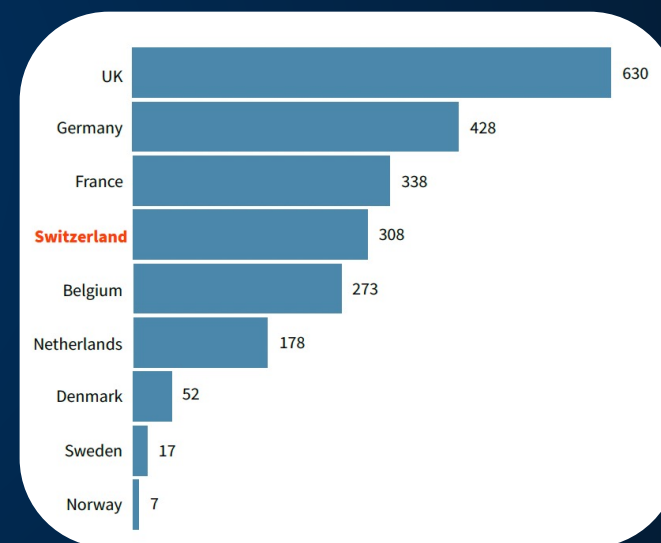enovating

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Deep Tech patents held by universities

Active patents held by top European universities

Leuven, Lausanne, Oxford, Zurich, Dresden and Cambridge lead
by Deep Tech oriented patents

- **8%** Catholic University Leuven
- **7%** Ecole Polytechnique Fédérale de Lausanne
- **5%** University of Oxford
- **5%** ETH Zurich
- **5%** Technische Universität Dresden
- **5%** University of Cambridge
- **65%** Others

Active patents held by top European universities
by university country

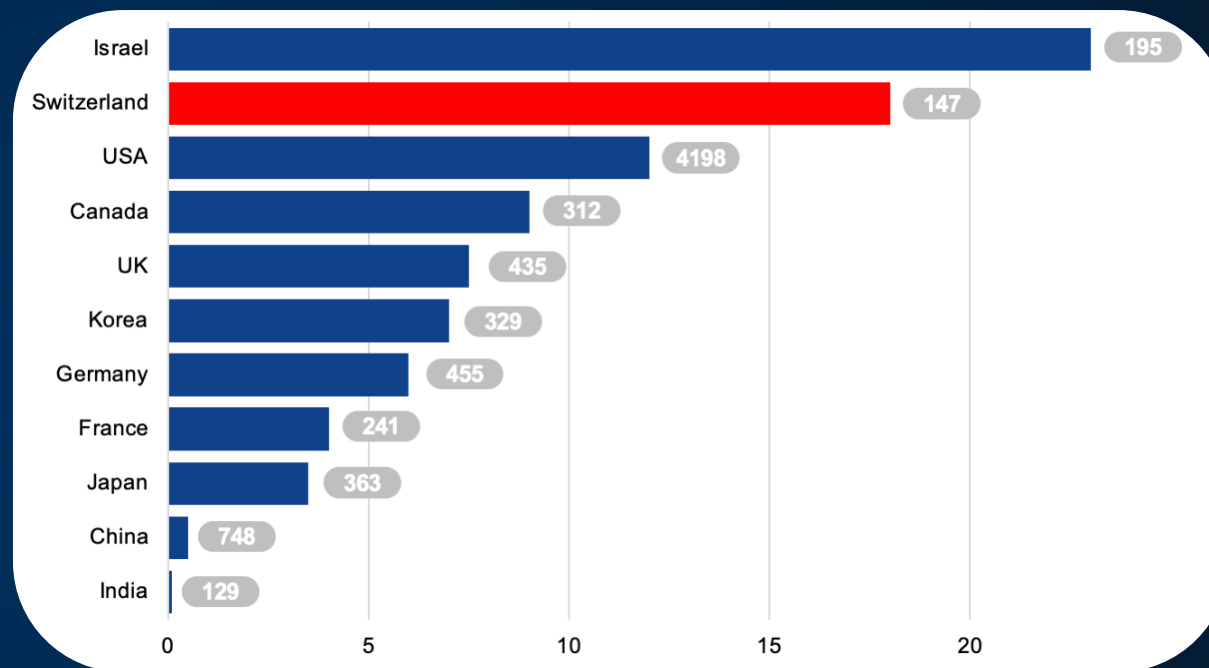| Country	Patents
UK	630
Germany	428
France	338
Switzerland	308
Belgium	273
Netherlands	178
Denmark	52
Sweden	17
Norway	7

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Density of Deep Tech companies in Switzerland

Number of Deep Tech companies per million inhabitants

There are a large number of startups in the area that focus on cutting-edge technologies such as Artificial Intelligence, biotechnology, cybersecurity, robotics, and virtual reality. Some notable startups in Western Switzerland include Flyability, Nexthink, Sophia Genetics, Lunaphore, Gamaya, and many others.

Country	Value
Israel	195
Switzerland	147
USA	4198
Canada	312
UK	435
Korea	329
Germany	455
France	241
Japan	363
China	748
India	129

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Ecosystem overview in Western Switzerland

1 **Schools and universities**

Western Swiss universities such as the EPFL, the University of Lausanne, the University of Geneva, the University of Fribourg, the University of Neuchâtel and the University of Bern are leading centers of research and education, which have developed expertise in advanced technology and innovation.

2 **Incubators and accelerators**

Swisscom Digital Lab, Fongit, Alp ICT, MassChallenge, and Seedstars World are organizations that offer incubation, acceleration, and mentoring programs to Deep Tech startups.

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Ecosystem overview in Western Switzerland

3 Investors and venture capital

Investors such as Swisscom Ventures, Lakestar, Index Ventures, Endeavour Vision in Deep Tech startups in the region.

4 Events and conferences

Many events are organized each year to bring together the actors of the Deep Tech ecosystem in Western Switzerland. Events such as the EPFL Forum, the Swiss Startup Day, the Seedstars Summit are some examples.

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Ecosystem overview in Switzerland

Zug: deep tech cluster

In recent years, the deep tech sector attracts a great deal of attention. Impacting all industries, deep tech companies and start-ups are creating disruptive solutions based on new technologies such as artificial intelligence, machine learning, robotics, drones, sensor technology, advanced materials, and blockchain. Companies in the Canton of Zug benefit from a fast-growing technology cluster, a highlyinnovative and dynamic business environment, a broadindustry-mix and access to highly qualified workforce.

- School of Computer Science and Information Technology
- Switzerland InnovationPark Central
- Technology Forum Zug (tfz)
- Mindfire Foundation
- Centre Suisse d'Electroniqueet de Microtechnique CSEM
- Blockchain / Crypto Valley
- Swiss Federal Institute of Technology Zurich (ETH Zurich)
- Swiss Federal Laboratories for Materials Science and Technology (Empa)

DeepTech in Switzerland

Ecosystem overview in Switzerland

The founding partners of the DeepTech Alliance are a diverse group working with and helping deep tech startups.

A truly international group from Sweden, France, Germany, Switzerland, Denmark, Italy, Spain and Israel.

Switzerland: ieLab

ieLab is the deep science accelerator connected to ETH Zürich, Switzerland.

VENTURE LEADERS DEEPTECH

Venture Leaders
Deeptech 2021

Meet the Swiss National Startup Team

venture leaders

| BlOOm | ISOCHRONIC | KOMP-ACT | LEDCity | matriq |
| MicroR systems | MIRAEX | oxyle | Perovskia | Readily3D |

www.venture-leaders.ch/deeptech

venturelab   swissnex   EPFL   ETHzürich   helbling   walderwyss attorneys at law   VAUD
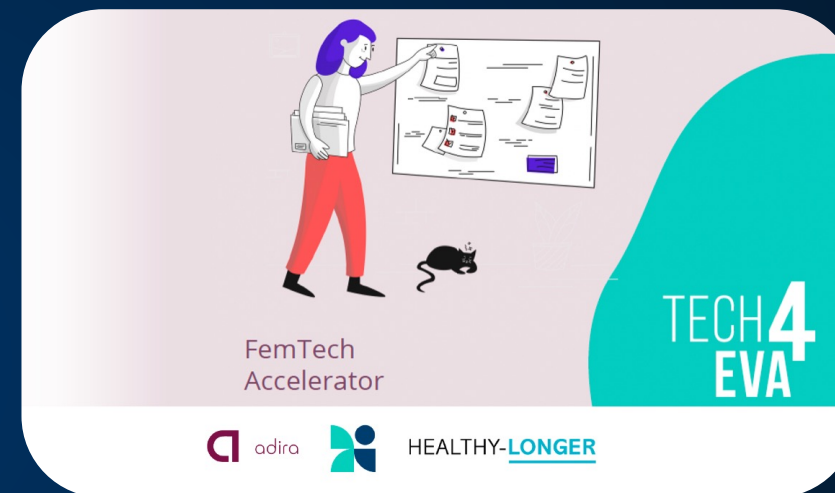
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Ecosystem overview in Switzerland

Innovation platform for FemTech

A global FemTech community and a 9 month equity free FemTech start-up acceleration program for companies developing innovative solutions to improve technologies relating to women's health with international reach.

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Ecosystem overview in Switzerland

Founded in 1998, the Swiss Biotech Association represents the interests of the Swiss biotech industry. To support its members in a competitive market, the Swiss Biotech Association works to secure favorable framework conditions and facilitate access to talents, novel technologies and financial resources. To strengthen and promote the Swiss biotech industry, the Swiss Biotech Association collaborates with numerous partners and life science clusters globally under the brand Swiss Biotech™.

Missions

- Developing favorable and competitive framework conditions
- Attracting talent, know-how and financial resources to drive innovation and growth
- Fostering networking through strategic, national and international partnerships
  Promoting the accomplishments of the Swiss biotech industry

88 new members

~200 biotech ventures, investors & industry partners on Swiss Biotech Ventures platform

90+ national and international industry events & Swiss Biotech Academy courses

~2,800 LinkedIn followers

~215,000 web visitors from 190 countries

~57,000 info mailings

65 media articles

DeepTech in Switzerland

Ecosystem overview in Switzerland

Space Research and Technology: Establishment of a European Space Deep-Tech Innovation Centre ESDI in Villigen (AG)

On 17 May 2022, State Secretary Martina Hirayama and Josef Aschbacher, Director General of the European Space Agency (ESA) signed a Memorandum of Cooperation between Switzerland and the ESA establishing a joint Centre of Excellence at the Paul-Scherrer Institute (PSI).

This Centre, named **ESDI for European Space Deep-Tech Innovation** aims at closing the gap between academic research and economic developments in space. It is intended to structure the ESDI around thematic platforms involving partners inside and outside Switzerland. The centre's activity will focus on identifying challenges resulting from ESA's own needs or from the space community at large. Material research, data management and processing, quantum technologies, as well as sustainable space ecosystem are planned to be among the first thematic platforms to be established to address these challenges. The ESDI will play a coordinating role and facilitate projects by leveraging existing infrastructures with a network of partners in universities and industry across Europe.

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