AEROSPACE
An innovation domain of the canton of Vaud
DEVELOPING THE AEROSPACE APPLICATIONS OF TOMORROW

The canton of Vaud is home to a rich network of aerospace specialists. The technologies and systems they are developing today will drive innovation in the aerospace sector for many years to come.

Vaud boasts a remarkably rich ecosystem of public and private collaborators operating at the cutting-edge of aerospace R&D. It’s one of many factors that contribute to continued growth in the region’s aerospace industry. Academic institutions with dedicated labs, as well as new and established companies, all work feverishly to transform research into real-world applications. Unsurprisingly, the depth of knowledge and expertise established in the canton of Vaud has spawned a raft of successful startups. Meanwhile, public institutions support the development of public-private partnerships capable of designing inventive technological solutions.

The École polytechnique fédérale de Lausanne (EPFL) Innovation Park offers technology-driven companies the opportunity to exploit cutting-edge research conducted by its highly specialized labs, as well as access to a large network of dynamic entrepreneurs and established companies, many of which are EPFL spin-offs.

EPFL’s Swiss Space Center and Space Engineering Center support academic and industrial access to space mission-related applications, coordinate space education, and develop state-of-the-art nano-satellites.

The Institute for Information and Communications Technology (IICT) at the University of Engineering and Management of the canton of Vaud (HEIG-VD) works on low-cost and low-power communications solutions and Internet of Things (IoT) technologies. Meanwhile, the Swiss Center for Electronics and Microtechnology develops high-precision scientific instruments for satellites and telescopes, along with smaller and smarter sensors.

An Aeropole Competence Center in Payerne integrates new high-tech companies in a top-end ecosystem composed of R&D centers, complementary companies and a supportive network of public entities.

“What SpaceX has been doing for a few years is amazing. This society fascinates us, we follow it for a long time. And behind it is the entire space industry that is progressing. Some companies, like ours, are taking advantage of them. Our approach is disruptive and proves that, contrary to popular belief, space costs are not prohibitive and could even be cheaper than terrestrial solutions.”

FABIEN JORDAN
CEO of Astrocast
BUSINESS OPPORTUNITIES

With established companies applying incremental improvements to proven technologies, and emerging companies exploring cutting-edge solutions to aerospace challenges, the canton of Vaud stimulates and supports emulation, synergies and knowledge-sharing.

“Working with the IICT at HEIG-VD, CSEM and the Swiss Federal Technology Institute, we are developing solar energy systems that will work efficiently at the edge of space.”

RAFAEL DOMJAN
Initiator and pilot, SolarStratos

ESTABLISHED COMPANIES PROVIDE EXPERTISE IN:
› Materials
› Structure and mechanisms for aerospace applications
› Development and manufacturing of micro-electromechanical systems
› Optical products
› Composite materials and materials science
› Connectors and cable assemblies

EMERGING COMPANIES ARE ACTIVE IN SUCH FIELDS AS:
› Nanosatellites that provide global machine-to-machine services
› Radio Frequency antennae
› Waveguide and filter products based on additive manufacturing
› High-precision haptic interface
› Electric motors for aircraft, helicopters and UAV actuation systems

THREE QUESTIONS TO RAFAEL DOMJAN, INITIATOR AND PILOT OF SOLARSTRATOS

SolarStratos aims to approach space with a solar plane. This is to demonstrate that thanks to the energy of the sun, it is possible to go higher than a plane operating at conventional energies.

You did an amazing trip in 2012. What are the next steps?
Our targets are: in 2018, we fly at 33,000 feet; in 2019 we reach the stratosphere; and in 2020 we go to 75,000 feet.

What guides you through this journey?
Our key drivers are innovation, renewables, optimism and ecology.

How did you achieve the funding of SolarStratos?
We have received financial and in-kind assistance from the canton of Vaud, the cities of Yverdon-les-Bains and Payerne, and the region of La Broye to set up our operational base at the Aeropole in Payerne and our administrative center at Y-PARC. We also work with international partners and the excellent logistics in Western Switzerland make coming and going easy.
LINKING SWITZERLAND AND THE WORLD

The canton of Vaud isn’t just a hub for Swiss aerospace – its reach is global. The region and the companies provide some cutting-edge applications to the world actors.

The region combines development of new technologies and know-how for avionic, space and stratospheric domains and usage of space technology for terrestrial applications. It also offers a unique multicultural and multidisciplinary aerospace ecosystem, ideally located in the center of Europe.

Swiss aerospace stakeholders have expertise and experience that can be leveraged by investors, entrepreneurs or established industry leaders looking to hire talent already adapted to this fast-developing domain.

Swiss products and services are universally associated with quality, reliability and exclusivity. The excellent reputation they enjoy is a clear competitive advantage for manufacturers and service providers who can position their Swiss-made products and services at higher price points.

Switzerland has turned its small domestic market into a strength, because from day-one its companies understand the need to focus on international business opportunities.
INCENTIVES AND SUPPORT

The canton of Vaud and the Federal Government have carefully planned fiscal, financial, infrastructural, academic and informational measures to support excellence in its aerospace ecosystem.

Depending on your organization’s project and its potential for adding value – for example, through job creation – you may be granted financial assistance or tax relief.

The region has a proud history of supporting ambitious tech projects. Companies operating in industry, production-related services and leading-edge technologies have access to direct financial incentives designed to support their most innovative projects.

At national level, grants are available through Innosuisse, the federal agency responsible for promoting innovation, to support applied R&D projects involving collaborations between firms and universities.

At the cantonal level the Foundation for Technological Innovation (FIT) provides support to many startups. Innovaud, which promotes innovation at cantonal level, has launched Scale-Up Vaud, an initiative that supports companies as they develop their businesses.

Vaud’s Office for Economic Affairs (SPECo) provides direct financial incentives for specific business projects to support the creation and establishment of enterprises, as well as the development of Vaud-based small and medium-sized enterprises (SMEs) and startups looking to innovate, or expand.

The city of Lausanne is a key player in aerospace and also a big contributor of the ESA Bic (located in Zurich). This Business Incubator Center collaborates directly with AP-Swiss and the Swiss Space Center, both located in Lausanne.

SWISS AEROPOLE COMPETENCE CENTER IN NUMBERS

- 40 hectares total surface area – land can be divided or tailored to your needs
- 2.6 km runway
- 4,000 m² of hangar surface
- 2,000 m² of office space
- 190,000 m² of land for sale
- more than 500 employees of the Swiss Air Force
- more than 30 specialists trained annually in polymechanics and electronics
- 1h15 from Geneva airport

CURRENT COMPETENCIES AT AEROPOLE INCLUDE

- Aeronautical and space industry
- Composites (aerospace, nautical and automotive industry)
- Energy and green energy industry
- Autonomous vehicles industry
- IT solutions (data analysis, environment, topography)

“In the long run, our objective is to become an actor of reference in the domain of antennas for satellite telecommunications, in space and on ground. Our potential clients are called Airbus, Boeing, Space X or Thales Alenia Space.”

EMILE DE RIJK
CEO, SWISSSto12
A strong push within academia (EPFL, HEIG-VD, CSEM) fosters the development of new startups and provides support for new initiatives within existing companies.

The region offers the whole spectrum of public and private capabilities necessary to develop aerospace applications. Capabilities currently include avionics, sensors, material sciences, low-power communications, flight and orbiter mechanics, low weight materials and structures, and optics, to name but a few.

Proximity to worldwide top-ranked Swiss research and teaching institutions allows businesses to benefit from one of the best scientific and academic environments in the world.

“Through the ESA, we have the possibility to invest up to CHF 3-4 million to help develop an idea, as soon as it is destined to become a real commercial service. Beyond that, there are investors in this country who see the added value of these startups and support their development.”

José Achache
Managing Director, AP-Swiss
## MAIN ACTORS OF AEROSPACE ECOSYSTEM

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RESEARCH AND DEVELOPMENT

CSEM Aeronautics & Transportation
Develops technologies – including low-weight materials and structures, and smaller, smarter sensors – that help achieve emission-reducing aerodynamic improvements, all while maintaining and even increasing safety levels.
csem.ch/Aeronautics

CSEM Space and Astrophysics
Provides highly precise mechanisms and scientific instrumentation for satellites and telescopes. Their development of compliant mechanisms for use in space exploration has led to quantum leaps in performance and results.
csem.ch/Space

EPFL – Interdisciplinary Aerodynamics Group IAG
IAG is involved in a wide range of basic and applied research in computational and experimental science and engineering with an emphasis on aerospace and aeronautics, including: Hypersonic Aerothermodynamics, Flight and Orbital Mechanics, Fluid Particle Interactions, Plasma Aerodynamics, System Engineering, CFD Tools.
iag.epfl.ch

EPFL – Space Engineering Center ESPACE
EPFL’s Space Engineering Center is an interdisciplinairy unit responsible for federating the School’s space and drone activities. Specifically, eSpace coordinates space education at EPFL, develops state-of-the-art nanosatellites, and fosters space and drone research on campus.
espace.epfl.ch

EPFL – SUPAERO
A unique higher education and research institute with expertise in the fields of aeronautics and aviation.
sti.epfl.ch/page-1609-fr.html
EPFL – Swiss Space Center
The Swiss Space Center provides a service supporting academic institutions, Research and Technology Organizations and industry to access to space mission-related applications, and promote interaction between these stakeholders.
spacecenter.ch

Institute for Information and Communication Technologies (IICT) at HEIG-VD
Conception and development of low-cost and low-power communications solutions. Their activities include the conception, development and testing of a variety of technologies with implications for applied electromagnetism, RF communications, and IoT technologies.
iict.heig-vd.ch

Swiss Welding Institute (SWI)
SWI is a training and certification center. The Institute delivers:
› IIW/EWF recognized theoretical and practical training
› International welding certifications – ISO 9606, ISO 13585, EN 1418, etc.
› International IPC certifications in electronic soldering
SWI can also provide consultancy services on request.
iag.epfl.ch

12 million
the amount of investment raised by Astrocast between 2017 and 2019 (CHF).
Almatech
Almatech specializes in the conception, engineering, manufacturing, assembly and testing of mechanisms and structures for the space industry.
almatech.ch

Astrocast
A network of nanosatellites providing global machine-to-machine services (M2M) to global businesses at the lowest industry cost. The platform can connect, manage and track the remote assets.
astroc.com

APCO Technologies
APCO Technologies specializes in the design and manufacturing of high-quality equipment for the space industry.
apco-technologies.eu

Confectronics
The company offers experience in the field of cable assembly, wiring devices and in the Macromelt molding.
confectronic.ch

Décision
Décision produces innovative structures that take advantage of the extraordinary properties of composite materials.
decision.ch

EnviroScopY
Consulting, installation, training, and technical and scientific assistance to purchase scientific equipment such as Lidar.
enviroscopy.com

Fimutens Suisse
Fimutens is specialized in the manufacturing of aircrafts and space vehicles.
fimutens.com

Fischer Connectors
Fischer Connectors manufactures high-performance, push-pull circular connectors and cable assemblies.
fischerconnectors.ch

Force Dimension
Force Dimension has earned international recognition for designing and manufacturing high-precision haptic interfaces for operating industrial and medical robotic systems.
forcedimension.com

KOMP-Act
KOMP-Act aims to develop breakthrough electric motors for aircrafts, helicopters and UAVs actuation systems, as well as for electric aircrafts propulsion systems.
komp-act.com

LD-Switzerland
LD-Switzerland specializes in the development, manufacturing and marketing of helmets for the aviation sector.
ld-switzerland.com

LEMO
The leader in the design and manufacture of precision connection and cable solutions. LEMO’s high quality connectors are found in a variety of environments.
lemo.com

LIGENTEC
LIGENTEC offers its proprietary platform based on the Photonic Damascene Process, targeted at applications using integrated photonic chips from visible to mid-IR.
ligentec.com

LN Industries
Specialists in precision tubes, profiles, electrodes and sensors for various markets, including aerospace.
swiss-tube.com
North Thin Ply Technology (NTPT)
Revolutionizing the world of laminate composites with significantly improved mechanical properties.
thinplytechnology.com

PIEMACS
PIEMACS provides innovative approaches to piezoelectric MEMS engineering services through short- and long-term contracts centered on excellent scientific consulting and fast engineering prototyping.
piemacs.ch

Quality Control
Promotes quality and security through material science and mechanical engineering.
qualitycontrol.ch

RUAG Space
Ruag possesses outstanding technological capabilities in aerospace as well as security and defense.
ruag.com

Safran Colibrys
colibrys.com

SCHOTT
From customized glass development to high-precision optical product finishing and metrology, SCHOTT develops solutions for applications in optics, astronomy, architecture, and research.
schott.com/advanced_optics

Solar Impulse
Flying 5 consecutive days and nights with no fuel, Solar Impulse was the first solar airplane to accomplish an oceanic crossing.
solarimpulse.com

SolarStratos
The company made the first round-the-world trip powered by solar energy and demonstrated the possibility of using renewable energy in this type of autonomous travel.
solarstratos.com

SWISSto12
SWISSto12 is an innovative technology company pioneering the development and commercialization of Radio Frequency (RF) antenna, waveguide and filter products based on additive manufacturing.
swissto12.ch

Viasat
Viasat is on a mission to connect the world by making the internet accessible, affordable and secure to everyone.
viasat.com

Yasava Solutions
Solutions for interior aircraft design by using cutting-edge engineering, advanced ergonomics and socio-cultural parameters.
yasava.com
NETWORK OF SUPPORTING PARTNERS

**AP-Swiss**
AP-Swiss is the Ambassador Platform of the European Space Agency’s ARTES Applications programs in Switzerland. It is a partnership between the European Space Agency (ESA) and SERI. P-Swiss is part of the ESA Business Incubation Center ESA BIC Switzerland.
ap-swiss.ch

**Economic Development – Canton of Vaud (DEV)**
The DEV is the main contact for foreign companies looking to set up in the region. To fulfill its role, the DEV works with both private (banks, notaries, lawyers, etc.) and public partners (various government departments). It provides advice on administrative procedures and financing, and allows newly established companies to benefit from its vast network.dev.ch

**ESA BIC**
ESA BIC Switzerland is the place for entrepreneurs with a link to space technologies to realize their innovative ideas and transfer space technologies to other areas of the economy.esabic.ch

**Innovaud**
Innovaud is the access key to innovation in the canton of Vaud. Offering free-of-charge support for startups, scale-ups and SMEs, Innovaud is focused on technology-based innovations. Support includes financing, access to innovation parks, coaching and promotion/networking. Innovaud helps innovative companies in Life Science, Information and Communication Technology, Precision Industry and Cleantech.innovaud.ch

**Micronarc**
The Micronarc communication platform brings together all the cantons of Western Switzerland. Its aim is to develop and promote the micro- and nanotechnology cluster common to this region, from a scientific, technical and economic point of view. It thus highlights the infrastructures for training, R&D, technology transfer and hosting, as well as the companies located there.micronarc.ch

**Office for Economic Affairs and Innovation (SPEI)**
The SPEI supports companies established in the canton of Vaud, and more specifically those active in the sectors of industry and advanced technologies. SPEI advises and informs entrepreneurs, particularly by putting them in touch with the appropriate organizations according to their specific needs. SPEI can also provide direct financial support.invest-vaud.swiss

**State Secretariat for Education, Research and Innovation (SERI) – Space**
Switzerland actively pursues endeavors in the space sector, focusing on the development of space applications to improve the quality of life for citizens, long-term commitment to space exploration for the progress of innovation and significant scientific and industrial contributions to make the country a competitive and reliable partner.sbf.admin.ch/sbfi/fr/home/themes/affaires-spatiales.html

**swiss aeropole**
Aeropole aims to play a significant role in the aeronautics, aerospace and autonomous solution sector. It is a birthplace of the solar-powered aircraft Solar Impulse, and now Solar-Stratos has chosen to settle down in Payerne. From project setup, to growth stage, passing through creation on the way, swiss aeropole gears up to welcome new high-tech companies.aeropole.ch

**Technopôle Ste-Croix**
National Center of Excellence in microwelding and point of reference for additive manufacturing.technopole1450.ch

**Swissmem Romandie**
Swissmem is the leading association for SMEs and large companies in Switzerland’s mechanical and electrical engineering (MEM) industries and related technology-oriented sectors.swissmem.ch