UNUSUAL CAREERS
ALUMNI WHO SWITCHED GEARS

CAROLE TROUSSEAU
THEATRE MANAGER
AND OPERA SINGER

SLED DOG TRAINER
BOARD GAME EDITOR
MILITARY ADVISOR
RACE CAR DRIVER
Nous vous aidons à les protéger

Vos idées vous appartiennent

Brevets
Marques
Designs
Veille technologique
Promoting open science is part of our responsibility as a top-tier technological institute and it’s one of our priorities for the years ahead.

During my first months as president, I have had the honour of meeting many of you at the conferences in Zurich in February, in San Francisco in May and—for our more athletic alumni—at the 20 km run in Lausanne in April. I’m delighted to see how attached you are to EPFL and how much the school still means to you. Your ideas are important, and I look forward to chatting with many more of you over the coming months and years.

The Gala EPFL Alumni will be held on the school’s campus on November 17th. It will be an excellent opportunity for me to present to you what I’ve done during my first year as president, talk to many of you and bring everyone together to celebrate our school and the excellent research we do here. I look forward to seeing you soon.

We are also pleased to announce that the Swiss Data Science Center opened in February. This is a joint project with EPFZ, and the goal is to promote multidisciplinary research, open science, and innovation in data science and information technology. The project not only allows us to collaborate with our colleagues in Zurich, but it is also a big step forward in terms of making science more accessible and improving the dissemination of knowledge.

Martin Vetterli, President of EPFL
Dear alumni,

For a little over six years now, I’ve had the pleasure of heading up EPFL Alumni—formerly A3. Every day, I receive messages from the school’s 30,000 graduates. Sometimes it’s a retired graduate writing to say how proud they are to have studied at EPFL or EPUL. Other times it’s someone looking to launch a start-up, or volunteer their time to represent EPFL abroad. Some people want to promote science among the younger generation, while others want to help students find the right job or profession. And some people just want to visit the campus, continue their education or socialise with other alumni.

Our most precious asset is the relationship we have with our alumni. I have thoroughly enjoyed working to nurture that relationship over the past few years. The EPFL Alumni department is doing very well, thanks to your support and enthusiasm for the school. Each year, dozens of alumni take advantage of the career services that we started offering in 2015. Hundreds of people have volunteered to help coordinate the 25 EPFL Alumni chapters outside Switzerland, or share with other alumni the technical skills they have acquired in their professional lives. Some 6,000 of you have taken part in the 160 events organised worldwide each year. And the school’s 30,000 graduates stay informed about EPFL’s latest innovations by reading our magazines and emails, and by following us on social media. Ours is a well-connected and lively community.

Now it’s time for me to pass the baton and set my sights on new challenges. I am delighted that Leïla Ojjeh (CH’94) will be taking over as head of EPFL Alumni (read more about her on page 36). She will be supported by a team of hard-working colleagues who are brimming with ideas and advice of all sorts.

Some of you no doubt feel the same way I do: EPFL is sort of like an addiction. Once you set foot there, you want to keep coming back. You want to see how the campus has changed, learn more about the latest scientific discoveries and chat with young (and not-so-young) scientists, entrepreneurs and professors. And sometimes, you just want to spend some time with friends and colleagues.

That’s why I’ll be attending the EPFL Alumni Gala on November 17th—as a spectator this time. I’ll be curious to see what exciting things the school has planned for us.

Thank you for your dedication to EPFL. And please keep sending us your news—we love hearing from you! ||

Annelies Garcia,
head of EPFL Alumni
ALUMNI WITH UNEXPECTED CAREERS
Meet five alumni whose careers are quite different from their first academic training.

A NEW ERA FOR DOODLE
Since 2016, Gabriele Ottino (PH’02) has been CEO of Doodle, a meeting scheduling company. He discusses Doodle’s future challenges.

A NEW FACE LEADING EPFL ALUMNI
Leila Ojeh (CH’94) will replace Annelies Garcia at the start of the next academic year.

ALL THE POTENTIAL OF BLOCKCHAINS
Said to be secure and unhackable, blockchain technology is winning over all economic sectors. Overview.
If an asteroid 200 metres wide were to hit a city the size of London, only 3% of deaths would be a result of the impact itself, according to a study by the University of Southampton in the UK. The majority of deaths would be due to explosions or heat and pressure waves, as well as extremely violent winds after the impact. Luckily, this type of asteroid only hits Earth every 40,000 years on average.

This is the surface area of the new building of the Copenhagen International School, which is covered in solar panels. It is almost the size of a football field. It is one of the largest solar power stations integrated within a building in Denmark. The panels, built using a technology developed by EPFL, will provide 300 MWh of electricity per year, which is more than half of the school’s energy needs.

A system of cameras designed by EPFL has been tested at the University Hospital of Zurich to monitor premature babies. The previous sensors would be placed directly on the skin and would generate false alarms. The new system can detect heart rates from variations in skin colour. Breathing is measured by the movements of the thorax and the shoulders.

The new RTS location on the EPFL campus is expected to open by the end of 2020. The building will be used for many things. Most of the space is dedicated to radio studios (currently at the Sallaz location in Lausanne), but there will also be a television studio and an incubator for young companies in the media and communications industry.

A childcare centre and an administrative building are currently located where the RTS building will be. The childcare centre will be rebuilt a few metres away and the administrative building will be relocated on the EPFL campus.

The architecture firm Office Kersten Geers David Van Severen, who will oversee construction of the new RTS building, describes it as a “transitional point between the EPFL and UNIL campuses”. This will also be the case for EPFL and RTS. Bringing these two institutions together will “strengthen cooperation between disseminating knowledge and technological innovation in media, as well as develop the digital humanities”, said Pascal Crittin, director of RTS.
ESSENTIALS FOR GEEKS

Our alumni select the items that they love.

A programmable drone

“T’im passionate about drones. The QX90 by Eachine is my favourite at the moment. It only weighs 56 g and has a wheelbase of 90 mm, yet it is equipped with a battery, camera and transmitter. This model also has the advantage of being programmable, so that I can program flight parameters, engine power and even communication frequencies with the receiver using a piece of software.

I also use Fat Shark goggles, for a fully immersive flying experience. I can see the image from the camera and fly through the trees, in the park or at home. The experience really makes you feel like you are flying.”

Block out noise

“I fly at least once per month, and normally on transatlantic trips. I’m not a big music lover, so I resisted buying top-of-the-range headphones for quite a long time. I therefore spent my time during the flights on trying to concentrate despite the noise or trying to stop the earbuds provided from falling out.

I finally gave in and bought noise-cancelling headphones. Now I can work, listen to music or watch films during a flight as if I were sitting at home. The headphones are sturdy and designed with frequent travellers in mind.”

Measure anything

“I sometimes keep a laser-pointer on me just to give my spatial awareness a workout or for precision when I’m doing DIY projects. It lets me measure distances of up to 20 metres.

I work in IT but I studied architecture, and I’ve never lost my curiosity for this field. So that I can understand objects correctly, I like to know the dimensions of the things I see around me, for example, the size of a room or the distance between two points.”

DANGEROUS EMISSIONS

Atmospheric methane and other short-lived greenhouse gases will continue to increase sea levels for several centuries, even after a potential halt or decrease in emissions. Scientists at Simon Fraser University in Canada have demonstrated that these gases—which encourage thermal expansion—have a long-term effect, as oceans absorb and release heat very slowly.

ON THREE LEGS

Imitating nature is not always the best solution. Hexapod robots traditionally moved around in a “tripod” manner (with three points of support at all times). This was inspired by insects, who walk this way because of their sticky legs. But researchers from EPFL and UNIL discovered a way for these bio-inspired robots to move faster and more efficiently on flat ground: by walking in a “bipod” manner (with only two points of support).
"Earth is closest to the sun in wintertime. It seems counterintuitive, then, that temperatures are not higher in winter," says Frédéric Courbin of the EPFL’s astrophysics lab. So what is it that influences temperature throughout the year?

The Earth turns around the Sun on a tilted axis that is not perpendicular to the orbital plane. That’s why we have seasons.

"Why is it colder in winter even though the Sun is closer to Earth?"

Frédéric Courbin
Lecturer
Faculty of Science, Astrophysics laboratory, EPFL

Prehistoric Medicine
Neanderthals self-medicated. Our distant cousins ate poplar, whose buds contain high concentrations of anti-inflammatory or analgesic substances. This discovery was made by a team of international researchers who studied dental plaque from four fossils of Neanderthal men, dating back 42,000 to 50,000 years.

Refreshing Blood
How can we give our blood a second life? The protein osteopontin could be a key. German and American researchers discovered that when mixing osteopontin with another activating protein and old stem cells, the stem cells produced as many white blood cells as young stem cells. This could stimulate the immune system of the elderly.

Multilingual Wikipedia
There are 5.4 million articles in English on Wikipedia, 1.8 million in French, and only 3,400 in Romansh. To reduce the inequalities in this online encyclopedia, a researcher from EPFL has developed an algorithm that detects the pages with the most significant deficiencies for every dialect. The missing topics are then indicated on the Wikipedia GapFinder platform where they can be edited.

Questions
Children of alumni ask EPFL experts some questions.

Name: Juliette Garcia, daughter of Patrick Garcia (SC’00)
Age: 10
Dream job: food critic or actress

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Cybersickness

These are secondary effects caused by the technology used in virtual reality headsets. “Cybersickness” can have various symptoms, from a feeling of discomfort to fainting. According to a study conducted by French video game publisher Ubisoft, out of 400 virtual reality players, close to half reported they were affected by these symptoms. Even the CEO of Oculus VR, the company that developed the Oculus Rift headset, complained of these effects when testing the first prototypes.

Zealandia

This is the name proposed by the Geological Society of America (GSA Today) to denote the “seventh continent”. The continent has more surface area than India, but 94% of it is underwater. New Zealand and New Caledonia are the parts that are above water. Scientists have been aware of this mass since the 1990s, but it has never been considered a continent until now.
Entrepreneurs, business angels, mentors, industry leaders, scientists... Some 400 people attended the 2017 Startup Champions Seed Night.

Tej Tadi, founder and CEO of MindMaze, gave the keynote speech. MindMaze is a spin-off of EPFL and was founded in 2011 to develop technologies that help patients recover from brain injuries. It was valued at $1B in 2016, which made it a Swiss start-up unicorn.

From medtech to energy, ICT and aerospace, 22 start-ups pitched at the event and participated in the competition. You can find the full list of start-ups and their descriptions on the page dedicated to the event on EPFL Alumni website.

Dean of the School of Basic Sciences
at the Ecole polytechnique fédérale de Lausanne (EPFL)

EPFL – the Swiss Federal Institute of Technology Lausanne – invites applications for the position of Director of the College of Management of Technology. With an international reputation for excellence, EPFL is one of the foremost European institutions of science and technology. Its campus provides a unique and vibrant learning and research environment located in the French-speaking area of Switzerland, on the shore of Lake Geneva.

Reporting to the President as part of EPFL’s senior management, the CDM Director leads the strategic development of the College, provides vision and leadership for its teaching, research and outreach activities, and oversees its administration. The CDM is currently active in 3 main areas: Management of Technology & Entrepreneurship, Public Policy, and Financial Technology. It provides engineering and science students with cutting-edge education in these 3 areas, thereby nurturing the next generation of innovative business and policy leaders. Furthermore, the CDM promotes excellence in research and develops world-class executive education programs.

The successful candidate has an outstanding academic record in one of the aforementioned 3 areas. Experience in building diverse, collaborative teams, working with a range of internal and external partners, developing transversal initiatives, and experience in fundraising are key assets. The position offers competitive personal compensation, tenure at the full professor level, and financial support for the candidate’s research program. The candidate should be willing to act as the Director of the CDM for at least one term of 4 years and to start in early 2018.

Please submit a curriculum vitae, a vision statement and the names of up to five professional references by August 31st, 2017 using the following website:

https://academicjobsonline.org/ajo/jobs/8993

Inquiries, nominations, and expressions of interest can be addressed to:
Prof. Harald Brune, Chairman of the Search Committee
harald.brune@epfl.ch

EPFL is committed to increasing the diversity of its faculty, and strongly encourages women to apply.
IN A CITY NEAR YOU

MEETING WITH MARTIN VETTERLI IN ZURICH
APRIL 6TH

The EPFL Alumni Eastern Switzerland association was honoured to invite alumni to Zurich to meet EPFL’s new president, Martin Vetterli. After his first 100 days as president, Martin Vetterli presented his strategy and ongoing projects, as well as developments and new challenges at EPFL, followed by a question and answer session. Guests were able to continue the discussion over drinks.

VISIT OF PAINTING EXHIBITIONS IN BEIJING
MARCH 18TH

The Art Museum of Beijing Fine Art Academy displays works by Qi Baishi as its main feature. It also collects modern Beijing Style paintings. Alumni had the opportunity to discover these exhibitions as well as the spectacular architecture of the museum.

A NEW CHAPTER IN THE NETHERLANDS
MARCH 9TH

A new chapter of EPFL Alumni opened at the beginning of the year in the Netherlands. Its goal is to organise events in various cities throughout the country over the next few months. The first meeting took place on March 9th in The Hague. Around 20 alumni gathered to meet each other over drinks.

SWISS UNIVERSITY ALUMNI MEETUP IN BANGALORE AND MUMBAI
JANUARY 16TH AND 20TH

Swissnex India organized the 2017 Swiss University Alumni Meetup in Bangalore (January 16th) and Mumbai (January 20th). During these events, alumni had the opportunity to experience “Inside Real Virtuality” by Artanim: a multi-user immersive platform combining a 3D environment which can be experienced through a VR headset with a real life stage setup. The demo was followed by a dinner.
Record-high participation in the Lausanne 20km race

More than 600 runners from EPFL, including president Martin Vetterli, took part in this legendary race in the canton of Vaud.

On April 23rd, and for the second year in a row, the École Polytechnique Fédérale de Lausanne (EPFL) had a team on the start line of the Lausanne 20km race. In total, 622 graduates, students and staff members ran the race, thanks to the efforts of EPFL Alumni. This was a record, surpassing the 513 EPFL runners who participated in 2016! Martin Vetterli, EPFL president, also ran the race before heading over to the school’s stand to award medals to the runners with the fastest times.

The buffet following the race brought participants together to swap stories. A photo booth was also set up for individuals and groups alike who wanted a souvenir of the day. Photos from the event can be found by visiting www.epflalumni.ch.
Are you too busy creating wealth to manage it?
Doodle is celebrating its ten-year anniversary. Since 2007, web users from all over the world can radically simplify organising their meetings, thanks to this Swiss online service that does not require a username or password. CEO Gabriele Ottino received a degree in Physics from EPFL in 2002. While it may seem as though his degree has little to do with his current position, his career path is actually not surprising, given Ottino’s curiosity and willingness to venture into unexpected territory.

A love of adventure was fostered quite early in his life. He was born not far from St. Gallen, but decided to study in Lausanne. “French-speaking Switzerland and EPFL, which was still a young school at the time, represented freedom to me,” says Ottino. “It was also a chance to get away: if I studied at EPFZ, I would have been able to go home to my parents almost every day.”

In addition to his studies, Ottino took full advantage of life on campus. He joined the Satellite committee, a community-based, festive organisation that still brings back fond memories.

During his studies, Ottino realised that he would rather enter the business world than academia. This idea was confirmed when he participated in a university exchange programme in Stockholm. “The Financial Times was given out at the university for free. I read it every day and was fascinated by the economic challenges and the stories behind big CEOs.”

With a physics degree from EPFL, Gabriele Ottino became a digital strategist. The economics wonk has been the CEO of Doodle since July 2016.

From physicist to Doodle CEO

Text: Arnaud Aubelle
A BALANCE BETWEEN STRATEGY AND MANAGEMENT

Ottino began his career in 2003 at the consulting firm Accenture, where he dealt mostly with clients from the German automotive industry. He learned many things, but the position was still too far from the strategic challenges he dreamed of. Determined to move towards leadership positions, Ottino went back to school in 2007 and received his MBA from London Business School. He received a no-interest loan for his studies from Fondation Acube (see inset). It was a very intense period of his life, as his daughter was also born during that time.

Ottino returned to Zurich in 2009 to get involved in entrepreneurship. He joined a fashion start-up before joining Tamedia Group in 2010. He began as a strategic project manager and then was head of digital strategy before becoming the CEO of Doodle—owned by Tamedia since 2014—in July 2016. This position, which was only supposed to be temporary while waiting for an external hire, was finally confirmed in early 2017.

Ottino’s new position is at the crossroads of management and digital and strategic development, and is a natural extension of his career path and aspirations. “It’s a perfect combination of strategy and operations. I was missing the concrete aspect in my previous positions, but now the balance is perfect.” Doodle has just over 30 employees and welcomes some 25 million unique users each month. It is a truly international success, as users hail from all over the world, primarily the United States, Europe and South America.

RETAILING USERS

After ten years, Doodle now faces many challenges for the future. The first, of course, is attracting more users. To do so, Doodle is developing new premium services, among other things, which will make the site easier to use and more reactive for users. The premium services were created with companies in mind: personalised colours for corporate branding, automatic reminder notifications, etc. “A major challenge is retaining our users,” says Ottino. “Currently, a single user uses Doodle only three or four times a year. We need new ways to encourage a more systematic use of our site.”

Another challenge is to balance sources of revenue between premium offers and advertisements, as the latter currently makes up the majority of revenue. Doodle is also actively monitoring the market to offer its users additional services. That is one of the reasons it acquired Meekan, a start-up developing an artificial-intelligence system that can automatically set up meetings based on the schedules and habits of attendees.

As CEO for almost a year, Ottino has taken on many projects to help Doodle reach new heights. He is a cycling enthusiast, who regularly biked up the steep hills of Lausanne, and is clearly not afraid of challenges.

INTEREST-FREE LOANS FOR CONTINUING EDUCATION

EPFL Alumni, via Fondation Acube, offers EPFL alumni honour loans with no interest for students to continue their education. Contact us to learn more: alumni@epfl.ch

BIOGRAPHY

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<thead>
<tr>
<th>Year</th>
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<td>2002</td>
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<td>2003</td>
<td>Consultant at Accenture</td>
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<td>MBA from London Business School</td>
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<td>2013</td>
<td>Head of Digital Stratgy at Tamedia</td>
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<td>2016</td>
<td>CEO of Doodle</td>
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EPFL alumni are leading innovation at Cisco

The Rolle headquarters of the US information technology company employs many EPFL alumni who are at the forefront of developing new technologies.

A leading company in telecoms equipment and IT networks for corporations, Cisco has two locations in French-speaking Switzerland: Rolle, where Cisco’s innovation takes place on a global scale, and in EPFL Innovation Park, where the engineering team helps to design and develop new products for the brand. Four EPFL alumni who are in both innovation and engineering roles at Cisco give us an overview of their jobs.

How can Cisco integrate artificial technology into its products? How can drones be used to advance the company? How can blockchain impact the future? What are the opportunities in the Internet of Things (IoT)? At the Rolle office, Anuj Jain is head of the department that tackles these questions and many others. His goal is to identify current and future technological trends and then, in time, turn them into business opportunities. "No matter the size or purpose of a company, every business must be aware of the potential for obsolescence. One of our mottos is 'Disrupt or be disrupted', which means our job is to anticipate this risk."

Thus, one of Cisco’s key development challenges is spearheaded in the canton of Vaud. Jain oversees the daily management of a team of about 20 people. His team is also responsible for Cisco innovation hubs around the world, including in Berlin, London, Paris, Toronto, Tokyo, Sydney and Rio de Janeiro. The hubs are tasked with developing new technologies in partnership with key clients. This work cannot be done in a vacuum, and the team must remain open to players in innovation and research, such as local and international start-ups, institutions such as CERN, the IMD business school and private clients, in order to be able to best meet their needs. “Humility is a key value when tackling innovation. We work on extremely varied and complex topics which change every day.”

Another important aspect of Jain’s team is cross-disciplinary work: departments that would normally not interact very much can collaborate with innovative work. This could be the case with engineering and sales, for example. “I learned the cross-disciplinary approach at EPFL. I think it is a key component of the school and of the Microtechnology department in particular. The sheer variety of subjects studied and the diversity of student profiles amplify this approach.”

Jain still has fond memories of EPFL and his studies, as well as his collaborative work with Ingénieurs du Monde. He also met his wife on campus.

“Humility is a key value when tackling innovation.”
Cisco created a survey to determine which internal changes employees thought were most necessary. Many employees expressed a desire to encourage and facilitate the innovation process. The responses were very clear: most employees believed they didn’t have the time, resources or access to decision-makers required to develop new ideas.

Mathilde Durvy is now in charge of implementing these changes and empowering all Cisco employees to innovate. Her work includes the “Innovate Everywhere Challenge”, an annual competition among Cisco employees who would like to take on an innovative venture. Each team is made of up to five employees, who are often from different departments or countries. The teams become true start-ups in the making, with multiple selection rounds involving market experiments, minimal viable products, and video presentations. Finalists have the opportunity to pitch their venture to investors, Cisco customers, and corporate leaders.

“But the initiative doesn’t stop there. Many companies have developed similar programmes, but very few provide real opportunities for internal ventures to continue after the competition.” Another aspect of Durvy’s role is to ensure the longevity of these ventures. The winning ventures receive $25,000 to continue development, and benefit from a mentoring programme, adjusted working schedule and dedicated innovation spaces. After only two competitions, half of Cisco’s employees have already participated in the programme. Eight Cisco-made start-ups are still active. Among them are EVAR, which aims to integrate virtual and augmented reality in Cisco’s collaboration offering, and Rainmaker, a platform to plan, organise and manage media flow priorities as well as complicated and varied communication mediums.

Durvy closely follows the development of EPFL, especially internationally. This was an important aspect of her studies, as she spent an exchange year in the United States and now, as Innovation Program Lead, she seeks to involve all Cisco employees around the globe.
Oriol Lluch is a member of the strategic innovation team led by Anuj Jain. In particular, he helped develop a large-scale project with the city council of Barcelona that aims to redefine the cities of the future. This project uses Fog computing technology—a term invented by Cisco to define the homogenisation of data analysis and data security at all points of a network, from the cloud all the way to the devices on the edge—to develop a smarter way to manage a city.

“The project developed by Cisco and the City of Barcelona aims to improve the quality of life for residents.”

Traffic lights, waste, energy and even video surveillance systems: the project takes into account all the biggest urban issues. Sensors gather information and turn it into data that can be used by various municipal services in real time via a platform that presents all the data in a user-friendly interface. “Our long-term goal is to improve the quality of life for residents. Another major challenge is to reduce energy consumption and the operational costs for the city council.”

This model was designed to be applicable to other cities, as well as to the business world. Since the launch of the project, Lluch has focused specifically on innovation associated with artificial intelligence. Lluch identifies business opportunities and technologies related to artificial intelligence that can be directly applied to Cisco products. His project is currently in the first analysis phase, but it will result in a portfolio of unprecedented and innovative solutions that will be offered to Cisco clients in the near future.

Lluch first came to EPFL as part of an exchange programme in 2007. He then received his MBA in Management of Technology in 2014 and began his career here. “The multiculturalism that I found in Switzerland, first at EPFL and then at Cisco, is something I care about deeply.”
Born in Siena, Italy, Lorenzo Granai completed his PhD in the Signal Processing lab at EPFL, under Pierre Vandergheynst, who is currently the Vice President for Education. After stints in Japan and the UK, Granai began working at Cisco in 2009 and joined the team at EPFL Innovation Park in 2013.

Since then, he has led a team of about 15 software engineers. His team develops various products for Cisco, in close collaboration with other Cisco engineering teams around the world, particularly in India and at the headquarters in San Jose, California. International diversity is also alive and well within the Swiss team: the 58 employees on the EPFL campus come from 15 different countries.

Currently Lorenzo Granai and his team are working particularly on WiFi software for a large variety of clients, including universities, companies and hospitals. Each WiFi product meets the clients' specific needs, whether in terms of surface area, size of the population or security requirements. WiFi solutions are a key component of Cisco's business activity, as the company currently has about 50% share in the global market. After research and prototyping phases which take into account customer needs, the product is analysed for relevance by marketing. If the product successfully completes this analysis, the second phase of development and test can begin, before eventually putting the product on the market.

Cisco's presence on the EPFL campus is just one example of the collaboration between the two organisations; the company is always in contact with start-ups from the Innovation Park and regularly recruits students and interns. On a more personal level, Granai's return to campus meant he could fully benefit from the progress that the school has made. “I am very impressed by EPFL’s growth. Buildings like the SwissTech Convention Center didn’t exist when I was a student. But I’m also very impressed with the ambition and complexity of the projects that EPFL tackles, as well as the sheer variety of research fields on campus.”
Blockchain technology, known for its use with the encrypted currency bitcoin, is becoming more and more popular in all industries. Though it has enormous potential, blockchain technology still needs to resolve a certain number of issues, especially on the legal front.

Jean-Christophe Piot

In billions of dollars, the total amount that could be saved globally by using blockchains. Blockchains would make payment and clearing simpler.

300,000
The number of bitcoin transactions completed each day (since early 2017).

500
The total calculation power dedicated to processing bitcoin transactions is more than the 500 fastest supercomputers in the world put together.

3,000
The cost, in billions of dollars, of inefficient cybersecurity by 2020. Blockchains could reduce online crimes.

Sources: Goldman Sachs, Ernst & Young, McKinsey, World Economic Forum.

Milk contaminated with melanin, cabbage tainted with formaldehyde, pork containing anabolic steroids—over the past few years, China has experienced a number of food scandals. To improve local consumers’ trust in its products, Chinese e-commerce giant Alibaba announced a few weeks ago that it will use blockchain technology to guarantee the traceability of its food products. Each transaction will be tracked in a blockchain register, which is reportedly impossible to forge.

This example demonstrates the global enthusiasm for blockchains. In this peer-to-peer network, no form of central authority is required to certify or guarantee transactions made between members. This is where blockchains come in; it’s an independent database unlike the majority of payment systems, which remain centralised. This task is completed by the machines themselves, which all complete a series of cryptographic operations unique to each blockchain. Each node (see glossary on page 24) in the network keeps a copy of the register.

At regular intervals, the most recent transactions in progress are grouped into a new “block” of data, which is then added to the previous links of the chain. Since each block saves a short version (“hashes”) of itself and the previous block, the system is secure: changing a part of the chain would require changing all the copies at the same time on computers all over the world. This is an impossible endeavour, given the extent of the calculations that would need to be done.

“A blockchain is a technology that allows people who don’t know one another to trust each other,” said Louis Margot-Duclos, founder of OpenOrg, a specialised consulting firm based in Paris. It’s similar to a huge electronic register, shared by a large number of people around the world. It’s an immense notebook of lines of code. Anyone can read it and write in it, but information cannot be erased or destroyed from it.

Digital Currency
But can blockchains really change the world? Potentially yes, according to Bryan Ford, professor at EPFL and head of the Decentralized/Distributed Systems (DE-DIS) lab. “The first blockchain applications have the merit of popularising an old idea that computer scientists know very well: it is possible to build a functional social and economic system without requiring a third party to ensure that it functions properly.” That’s a big change, as those trusted third
Centralised register

Most current payment systems require a type of central authority known as a clearing house to verify or guarantee transactions. This is no longer needed with distributed registers; the best-known use is the cryptocurrency bitcoin: each machine keeps a copy of the register, which can be edited at any time but not forged.

Distributed register

FIGHTING FOOD INSECURITY

Chinese e-commerce giant Alibaba recently announced an interest in using blockchain technology to guarantee the traceability of food products sold on its platform. The decision comes after a flurry of food scandals in China in recent years. One of the most publicised scandals, milk contaminated with melamine, broke in 2008. As a result, authorities have seized a significant amount of products considered dangerous. In the photo opposite, two police officers take part in a seizure operation in Shijiazhuang (in the north of China) in 2009.
Why does a bitcoin transaction take 15 minutes?

Marie buys a cinema ticket for Jean, and he must pay her back. To do so, he installs an app on his smartphone and fills his wallet with bitcoins.

To pay Marie back, Jean needs his own private key as well as Marie’s public key (see glossary on page 24). He receives Marie’s public key by scanning a QR code on Marie’s smartphone.

The app alerts bitcoin miners (see glossary) that a transaction is in progress.

The miners’ computers verify that Jean has enough bitcoins to make his payment.

15 MINUTES

Cyprus scrambles for bitcoin

In 2013, a wave of panic swept over the island of Cyprus. Cypriots flocked to bitcoin, a virtual currency based on blockchain technology that neither governments nor central banks have control over. What triggered the phenomenon was the Cyprus parliament’s decision to accept €10 billion in financial aid from the Eurozone. In exchange, the government was required to tax all deposits greater than €100,000 made to the Bank of Cyprus at a rate of 47.5%. The decision provoked outcry from Cypriots, who showed their disapproval by organising several protests in front of the National Parliament.

In 2010, if the most famous cryptocurrency (see glossary on page 24) is automatically associated with blockchains, it’s because bitcoin’s mysterious creator, Satoshi Nakamoto (a pseudonym), built the currency on a virtual infrastructure based on these blockchains. The invention of bitcoin, a digital currency, brings up an important question: are countries and central banks ready to accept such a currency, “struck” from who knows where, created by a mysterious person, and one that circumvents the control of traditional authorities?

parties include banks (who ensure transactions), lawyers (who ensure that contracts are followed), central banks (who manage money masses) and countries themselves.

The blockchain process is often described as revolutionary. But is it really? Not quite, according to Alexis Roussel, co-founder of Bity, French-speaking Switzerland’s first cryptocurrency merchant. For Roussel, the buzz surrounding blockchains encourages many amateur players to follow the trend without any real legitimacy. “Technically speaking, the idea of these shared databases is not new. The principle of blockchains has been around for a long time,” said Roussel, entrepreneur and former president of the Swiss Pirate Party. Professor Bryan Ford agrees: “Blockchains are nothing but a combination of algorithms and techniques that we already know about.”

However, it’s not so much the technology that’s revolutionary but its applications: starting with bitcoin, which first appeared
but validation of a bitcoin payment could be immediate, while a card transaction is almost instantaneous, has not spread to the masses (there are methods. As a result, the use of bitcoin compared with traditional payment systems is limited. Bryan Ford agrees: “Regardless of what idealists or militants say, I believe that blockchains will never replace regular payment systems. But they could automate routine, risk-free tasks, and humans could manage the other tasks.”

According to Roussel, cryptocurrency can be used in another case when traditional systems are inadequate or abusive. “Bitcoin was used in Cyprus when the government started taking individuals’ bank accounts. It’s growing in Venezuela for the same reasons.” Beyond the protection it offers in times of crisis, cryptocurrency is a solution in some particular situations. “In Switzerland, 120,000 people are banned from opening a bank account. Some of them are credit-worthy, but increased regulations from banks make it impossible for them to open an account because of their citizenship, for example,” said Roussel. “Cryptocurrency could be a solution for that segment of the population, since they would no longer need to go through banks to obtain goods and services.”

Of course, cryptocurrency would first have to resolve certain outstanding problems: bitcoin is extremely volatile on the markets and transactions are much slower compared with traditional payment methods. As a result, the use of bitcoin hasn’t spread to the masses (there are still six million users currently). A credit-card transaction is almost instantaneous, but validation of a bitcoin payment could take several hours or much longer, if the transaction has to be verified. Each block has a unique identification number, a timestamp when it was created, and a reference to the previous block.

The block processing the transaction between Jean and Marie is placed in the network to be encoded through a series of complex cryptologic problems. When a miner solves one of the problems, it is announced to the rest of the network (“proof of work”). The algorithm pays the winning miner in bitcoins.

The new block becomes the most recent link in the blockchain.

Both Jean and Marie receive a message that their transaction has been verified.

**Zug: the blockchain capital of Switzerland**

Zug is home to approximately twenty companies specialised in blockchain technology. To encourage more companies to come to the city, Zug now accepts bitcoin payment for public services.

“A small globalised city,” This is how Dolfi Müller, president of the city of Zug, describes the lakeside city that is home to “Crypto Valley”. In just a few years, around twenty companies specialising in blockchains and related applications have set up shop in the region. These companies include Ethereum, a technology platform for smart contracts based on the cryptocurrency Ether (see glossary on page 24). Another is Monetas, a company focused on digital-currency transactions. There is also Blockchain Source, a consulting company, as well as Bity, a bitcoin and Ether distributor.

“Zug has a long history of openness and diversity, especially with regard to new technologies,” said Müller. “Eighty years ago, our ancestors established a very attractive tax law, which made it possible for us to be ready to face globalisation.” Indeed, Zug is well known for its advantageous tax situation. It is often considered the “tax haven” of Switzerland. As a direct result, the canton capital has more companies than actual residents. A few giants such as Glencore and Crown Resources have made Zug the Swiss capital for raw-materials brokerage.

Some of the most recent arrivals in Zug include a number of fintech companies. To provide a positive environment for these companies and to encourage new ones to come to the city, Zug began accepting payment in bitcoins in May 2016. It is the first city in the world to do so. For example, residents can pay for municipal services in cryptocurrency. Nevertheless, there is a limit of 200 Swiss francs on each transaction.

Zug’s strategy seems to be a success: Mike Gault, founder of Guardtime, announced in January 2017 that the company would open a branch in Zug. Founded in 2007, the software-security company is one of the pioneers of blockchain technology. Based in Amsterdam, Guardtime is one of the only companies to turn a profit using blockchains. It has an impressive client list, such as the Estonian government and the US Defense Advanced Research Projects Agency (DARPA).

For Müller, this is a logical next step. He recalls that the specialised companies in the valley were the ones who began talking about Crypto Valley—the term was coined in 2014 by the founder of Monetas. The city of Zug believes that blockchains could become for transactions what the internet is for information, even though the technology and cryptocurrencies are still limited in use. In Zug, “only three companies accept bitcoin payments,” admits the city president.
list of transactions to be verified (see diagram on the previous page) is longer than the network is able to calculate. “Of course, there are online vendors who offer bitcoin payments that are said to be immediate,” said Ford. “But in reality, these transactions are made through an intermediary, not directly via the blockchain.” Which is exactly what blockchains are supposed to avoid...

RELIABLE DATA RETENTION
Despite their limitations, bitcoin and similar cryptocurrencies like Ether (see inset opposite) are just as much wake-up calls to the current financial system. With an intrinsic value, cryptocurrencies are the first concrete manifestation of the potential of blockchains and their ability to remove trusted third-party intermediaries, who make up a large part of a market’s value. In addition to banks, many other players are starting to worry too. These include big companies such as Uber and AirBnB, whose profitability depends directly on the commissions they receive as intermediaries. In the future, users could very well turn to direct-interaction solutions.

Some have already launched, such as Steem.it or Synerro (social networks like Facebook). E-commerce platform OpenBazaar aims to compete with Amazon, while Arcade City is taking on Uber and its competitor, Lyft. Arcade City was created by a former Uber driver and is designed to go against certain practices of the California company, such as price centralisation and the 20% commission charged for each ride. The on-demand car service is operational in around 100 cities in the US and Australia. Drivers set their own rates and passengers are free to choose their driver. All this while flying under the radar of public authorities, who are seeking to regulate or control peer-to-peer exchanges.

Ford still maintains his enthusiasm for blockchains: “Despite what some people may promise, this technology probably won’t be a solution for all situations or solve all problems. But it is still an effective way to distribute and reliably retain data.” That’s no easy task, admits Ford. He gives the example of data protection and managing property titles. In the latter case, blockchain solutions could be particularly useful in cases where the state system is not reliable enough to guarantee ownership rights.

CIRCUMVENTING INTERMEDIARIES
In Ghana, the NGO Bitland aims to solve the following problem: close to 90% of rural land is not registered in an official database. Blockchain technology can create a transparent, unforgeable property
Three questions for labels. This does not guarantee transparency diffusion statistics compiled by music of artists and composers depend partly increasing complex contracts used in
chains offer a chance to reconsider an
In the arts and culture industry, block-tracking and help prevent counterfeiting.

It is also working on logistics chains. “Blockchains can be helpful to a manufacturer who needs to precisely track where ingredients or parts used in their products come from, especially if they are coming from all over the world,” said Ford. In the healthcare industry, a blockchain solution could also ensure scrupulous medication tracking and help prevent counterfeiting.

In the arts and culture industry, blockchains offer a chance to reconsider an economy with a large number of intermediaries between creators and consumers, as demonstrated for example by increasingly complex contracts used in current forms of consumption. The music industry is a good example: the incomes of artists and composers depend partly on diffusion statistics compiled by music labels. This does not guarantee transparency for the artists. Music streaming has greatly facilitated access to music, but it has also increased transparency for musicians as to the amount of royalties they receive. In this case as well, blockchain technology could track successive uses of an original file, which allows for a more just retribution for the people involved in creating the work.

A DEMOCRATIC SYSTEM
Blockchains, such as those used by Ethereum, could also be a base for smart contracts. These are digital contracts software to execute the terms of the contract with no human intervention once all parties have signed the agreement (see glossary on page 24). This could guarantee the legality of a lottery selection or make it possible for an electric car to automatically recharge at a charging station. The contract could negotiate the best price based on the energy-market situation at any given place or time. This could also render a leased car immobile if the latest monthly payment was not paid.

The potential for blockchains is enormous, but there are still a multitude of technical and legal problems to overcome. As is often the case, the the law has not yet caught up and is struggling to keep up with technological changes, and legislators aren’t sure how to deal with these new technologies. But in theory, the government could do what it wants, when it wants with bitcoin if it decides to start getting involved with cryptocurrency miners. That is one of the biggest concerns when it comes to cryptocurrency—some currencies being more affected than others.

Another problem, however, affects both public and private blockchains (i.e. closed or accessible via authorisation). Even when mechanisms to manage and secure exchanges or transactions are very powerful, the systems that clients use to interact with blockchains are often unstable and sooner or later rely on a third party. That is the case with “light” devices, such as smartphones. But when bitcoin transactions can be hacked, when user “wallets” are taken by other users. This problem must absolutely be solved before blockchain applications and use become widespread.

How can the use of blockchains become widespread?
The most advanced blockchain technologies—developed among others by EPFL’s DEDIS with the help of the ByzDcoin protocol—are tackling this problem. ByzDcoin allows devices with low power, such as smartphones, to verify that a transaction has been made correctly in a blockchain via a quick and simple check of digital signatures. With this technique, it is not necessary to continuously follow the blockchain. This avoids a costly transaction requiring lots of bandwidth. But such protocols are very complicated to develop. They are still experimental and not used enough throughout the industry. There are still many security problems that need to be resolved.

Can a cryptocurrency collapse?
I don’t think that bitcoin could fail or be destroyed because of its flaws. But as we have seen, it is still vulnerable. Its functioning mechanism is based on the validation of exchanges in the form of blocks. This process is completed by a large number of “miners”, who are individuals compensated for the calculation power of their processors. Seventy percent of this mining capacity is currently concentrated in processors owned by Chinese citizens, according to a 2016 study by the audit firm Deloitte. The Chinese government has taken a non-intervention stance.

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How secure is blockchain?
Introduction from Bryan Ford, a professor at EPFL and head of the Decentralized/Distributed Systems (DEDIS) Laboratory.

In August 2016, the price of bitcoin plummeted following the theft of 119,756 bitcoins worth €53 million on the Bitfinex trading platform. Are blockchains really secure? Many of the problems with blockchains are due to the fact that there is no human governance that can grant a structure the right to make decisions in the name of the “bitcoin community”. There is no one to decide how the currency could be managed or modified. Ether is more secure, because there is a form of governance behind all the electronic mechanisms.

Register. In this way, residents can benefit from government services and the state can collect property and real-estate taxes associated with the properties in the database. In Georgia, the government is working with start-up BitFury and economist Hernando De Soto Polar to tackle the same problem. The work focuses on the role of access to private property in supporting underprivileged populations and helping them increase their wealth.

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Chemistry

Studying chemistry leads to various careers, often outside of Switzerland. We take a closer look at the careers of four alumni.

Text: Robert Gloy

“Everyone supported each other”

“I knew that EPFL was on the threshold of something new”

ALAIN ALCHENBERGER, 1979
Co-director of the Givaudan Perfumery School, Paris, France

FABIENNE DUCHOUD, 2008
Application Specialist at EntroGen, Los Angeles, USA

“I did not plan to go into the perfume industry at all. When I finished my degree at EPFL, the classic chemistry industry was struggling. I got my first job in Geneva at Givaudan, which is now the world’s leading perfume company.

After training for three years to become a perfumer, I worked at Givaudan for six years before joining two other perfume companies: Créations Aromatiques in Geneva for 11 years, then Mane in New York for six years. In 2005, I came back to Givaudan to work in the research department near Zurich. Since 2015, I have been the co-director of the Perfumery School, focusing mainly on training student perfumers.

My memories of EPFL are associated with the beginning of its expansion. I had classes on avenue du Cour, but also in the new buildings. There was a lot of optimism at that time: we knew that EPFL was on the threshold of something new.”

“I was there for six years completing my PhD. My research field was initially biofuels, but now I work for EntroGen, a company specialising in oncology diagnostics. As for campus life, I always remember the revision periods. We had almost a month between the end of classes and the beginning of exams. It was always a time when we “suffered” together in small groups. Everyone supported each other and time in the library flew by. It was a very intense, but wonderful time.”

“Studying chemistry leads to various careers, often outside of Switzerland.”

We take a closer look at the careers of four alumni.

Robert Gloy

N Alumnist

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Even though I’m not an expert in all fields, I can now quickly master new skills. This is partly thanks to my academic career, which taught me to manage a large amount of information over a short period of time. I received my degree after four years and my studies were very intense.

After leaving EPFL, I spent several years at Novartis: first as a chemist at the headquarters in Basel, and then in Ireland as head of production, as well as in Germany as a production site leader. This experience led me to the role of global head of production in the animal health division. After spending two years in the US after the American group Elanco acquired the animal-health subsidiary Eli Lilly & Company, I began my current position at Johnson & Johnson in May 2017.

At EPFL, I was in a very international environment with passionate people. Professor Michael Grätzel’s thermodynamics course had a strong influence on me. He’s a trailblazer in his field and has a very pedagogical approach.”
Life Sciences and Technology class of 2008
Where are they now?

When they arrived at EPFL in 2003, these students were the first to begin the Life Sciences and Technology programme. For five years, they explored a new discipline at the intersection of biomedical science and engineering. When they graduated in 2008, their future was very promising. Here are a few alumni of the programme.

Hannah Schlaepfer
38
Saint-Léger (VD), Switzerland

"While I wrote a fascinating thesis on developmental genetics, I never really felt at home in the academic world. So I took the plunge and went into the industry. I started at the bottom of the ladder and began a new career at AC Immune, a biopharmaceutical company specialising in treating neurodegenerative diseases. I conduct and manage clinical trials. The corporate world suits me much better: I feel like I'm geared more towards action than reflection."

Bastien Schyrr
32
Neuchâtel, Switzerland

"Since 2015, I have been developing my start-up TheranOptics with a friend I met when I was a student in the Life Sciences and Technology programme. The start-up is based on my PhD research that I conducted at the Swiss Center for Electronics and Microtechnology in Neuchâtel after I graduated.

We develop systems of miniature flexible sensors that can monitor the progress of chronic wounds. In 2015, our start-up was recognised several times and we even received funding from the Gebert Rüf foundation. We will be able to continue developing this technology in partnership with EPFL."

Saskia Delpretti Anex
39
Saint-Léger (VD), Switzerland
Aurélie Pala
32
Atlanta, United States

“I always knew I wanted to do research, but I had to find my specialisation. I decided on neuroscience. Since 2015, I have been working on a post-doctoral programme at the Georgia Institute of Technology in Atlanta. I research how the hemispheres of the brain communicate with each other.

I’m used to life in the United States. I had already been there once, during the last year of my Master’s programme at Yale University. In 2008, I did return to Switzerland to get my PhD at EPFL. Five years later, I went back to the United States. I go where professional challenges take me.”

Simon Germann
34
Lausanne, Switzerland

“As graduating, I spent a lot of time with biostatisticians. I was a data manager in the pharmaceutical industry and spent four years at Merck Serono and then two years at Shire.

I was very interested in that work and was inspired to begin a new Master’s programme. In 2015, I began studying statistics at the University of Neuchâtel. It was a big change. I’ve been a statistician for the Vaud Tumours registry since 2016. If I had to do it over again, I would first study statistics and then life sciences. But one thing is certain: I don’t regret anything.”

Nils Rettby
35
Neuchâtel, Switzerland

“After graduating, I worked for a year as a research assistant in Boston. But I didn’t want to go back and get my PhD. I wanted to do something involving research and project management. I worked at CHUV from 2010 to 2016. I conducted clinical trials for the HIV vaccine, among others.

In 2016 I joined Celgene, a company that specialises in treatments for blood cancer. One of the things I really like about my job is being in regular contact with colleagues from all over the world.”
Nothing stops EPFL alumni from embarking on careers that diverge from their original field of study. Alumnist talked with five alumni who made their way off the beaten path.

NAME: Alexandre Imperatori  
SECTION: Computer Science  
YEAR GRADUATED: 2012  
CAREER: race car driver

At the tender age of four, Alexandre Imperatori was on holiday in Spain and watched his family go karting. Imperatori couldn’t let the adults have all the fun, so he insisted, convinced his parents and got behind the wheel for the very first time. The love of speed and competition has stayed with him ever since.

Originally from the canton of Fribourg, Imperatori started racing in France, where karting infrastructure is better developed. In 2000, he was crowned the junior karting champion of France at the age of 12. In 2004, he went to Asia to compete in his first Formula Renault races, a competition where participants race with identical vehicles and therefore all start off on an equal footing. Success came quickly, and Imperatori won the Zhuhai race in China that same year.

After his studies, he raced grand tourer (GT) cars and competed in the Porsche Carrera Cup, which he won in 2012. He began endurance racing in 2013 and joined the Swiss team Rebellion Racing in 2015. With the team, he won the 24 Hours of Le Mans race in the private LMP1 category in 2015 and became the world champion in the same category a year later.

Today, Imperatori is a world-renowned race car driver who has been successful in every category he has raced in. “Talent is essential, but being able to work hard and make sacrifices is just as necessary. The fact that I started at a young age was also a key factor.” Twenty-five years after his first races, he is now a professional behind the wheel.

Racing is a pricey passion, however. Until that point, Imperatori had been financed by private sponsors, mainly in the Geneva region. The prospect of joining a professional racing team was still uncertain: “I knew that nothing was guaranteed and I wanted to get a degree. I also really like computer science, so EPFL was a natural choice for me.” Juggling a budding racing career and studies at EPFL was a challenge. But Imperatori succeeded and received his diploma in 2012. This amazing feat was made possible through some arrangements with the school. For example, he would arrange deadlines with professors around his races, and studied abroad at the University of Hong Kong, which was closer to his racing events.

Arnaud Aubelle
Carole Trousseau is very passionate about opera and musical and artistic culture. She was brought up in a music-loving environment very early on—as a child, she learned music theory and the alphabet at the same time—and her passion for music has stayed with her ever since.

Her final work at EPFL was dedicated to the harmonic spectrum of the singing voice and is a testament to her love of art and music. While completing her Master’s degree in physics, she simultaneously studied opera at the Lausanne Conservatoire. She also studied in Germany and received a degree from the Cologne University of Music and Dance. After various concerts and productions in Germany, Switzerland and France, Trousseau entered the world of business and finance. In 2001 she joined the consulting industry, first as a consultant at PricewaterhouseCoopers, and then as the head of operational risk at PostFinance a few years later. After that, she was head of production for company censuses at the Swiss Federal Statistical Office. In 2010, she decided to go back to school while working and received a Master’s of Business Administration in Economics and Finance at HEC Lausanne.

Trousseau therefore led several professional lives before returning to her first love. In 2013, she became the administrative director of the Biel Solothurn Symphony Orchestra (TOBS). She is in charge of finance—with a budget of 14.5 million Swiss francs—and Human Resources—for close to 150 employees—as well as communications and IT. “The TOBS is a very unique institution, not only because of its geographic location between two cities and two cantons, but also because it produces its own plays and operas,” said Trousseau. It is indeed a unique creative force well-loved by the public, with more than 250 productions each year and record ticket sales in 2016.

As both director of the institution and an avid fan of all the productions put on at the TOBS, Trousseau is once again able to delight in both opera and the stage from behind the scenes. She plays a large part in making productions come to life. Singing also remains a hobby. After singing on-stage in her youth, Trousseau now sings for fun. Energetic, eclectic and curious: these qualities perfectly suit Trousseau, who herself calls her career “the work of a passionate person”.

The Physicist who became an Opera Singer

NAME Carole Trousseau
SECTION Physics
YEAR GRADUATED 1997
CAREER administrative director of the Biel Solothurn Symphony Orchestra
In the heart of the Norwegian forest, approximately 20km outside Oslo, the Sandbakken Sportsstue inn has been open for close to two hundred years. But ever since 2015, passing hikers used to local specialties now stop in for traditional Swiss pastries such as chocolate caracs and vermicelli chestnut desserts. This is because the inn is now owned by Sébastien Barrault, originally from Valais, and his Norwegian partner. Barrault has long been interested in the Far North. “When I was a child, I spent several weeks in Scandinavia and was struck by the connection to nature and the sense of freedom. I promised myself I would return,” he said. After graduating from EPFL in 2002, he went to study the properties of polar ice and oceanography at the University of Svalbard on the Norwegian island of Spitzberg. A few years later, he joined the Ny-Ålesund research base in 2010. The base is the starting point for many Arctic expeditions and the northernmost town in the world. There, Barrault managed the French-German research station. He welcomed researchers from both countries, managed logistics and ensured the viability of the material used during the expeditions.

At the end of his contract in 2013, he took off alone with his sled dogs to explore ice sheets for close to three weeks. He was able to test out being alone in a savage land that was home to polar bears and other animals. When he returned, he accepted a new position as scientific advisor at Ny-Ålesund. “I was in contact with the heads of the international research stations. It was a very rewarding experience culturally, adapting in order to work with people from ten different countries.” During the five years he spent on the research base, he witnessed the effects of climate change on a daily basis, including watching the polar ice melting and seeing the fjords less frozen every year.

Barrault learned Norwegian just by practising with the help of his partner, who always refused to speak in English with him so he would make progress with his Norwegian. “I was shy when speaking at the beginning. But I had to start somewhere and even made a few mistakes!” In 2015, the couple saw a listing in the national newspaper and applied to manage the Sandbakken Sportsstue inn. “In addition to the restaurant and the administrative work, we take care of our thirteen sled dogs and take visitors on sled rides with them. The inn also hosts seminars, conferences and visits from sick children.” Today, Barrault’s new life perfectly fits with his quest for open spaces and desire to be part of a local community.

**ARCTIC ADVENTURES**

**NAME** Sébastien Barrault  
**SECTION** Mechanical Engineering  
**YEAR GRADUATED** 2002  
**CAREER** restaurant owner and sled dog trainer
At the beginning, it was just something to help naturalise Hadi Barkat, an Algerian living in Switzerland for several years. “In 2007, while I was studying for my Swiss passport, I came up with the idea of creating a game to learn all the information in a fun way. And Helvetiq was born.” The board game came out in 2008 and was an immediate success: the first run of 3,000 games sold out in just a few weeks.

But making board games had nothing to do with the beginning of Barkat’s career. In 2001, after receiving his degree in Computer Science, Barkat entered the entrepreneurship world and joined the start-up Shockfish. There, he created SpotMe, a geolocation system to find sales partners during professional events. In 2004, his experience with startups led him to focus on venture capital. “I really enjoyed that career. I had the opportunity to travel and work on about 100 entrepreneurial projects each year,” he said. In 2008 when Helvetiq was released, board games were only a hobby alongside his career. That all changed in 2010, when he realised that the game was not only fun but could be a real commercial success. He decided to focus on Helvetiq full-time.

The company’s goals can be stated in just a few words: “Simple, striking concepts with an interesting yet refined design.” The company’s offer has expanded throughout the years to include a game about Swiss cantons, puzzles and even books. In particular, Helvetiq published *Randos Bière en Suisse* at the end of 2014, which became the company’s biggest success with 35,000 copies sold.

Growing the company internationally was simply a lucky coincidence. “When I was living in Boston, a Helvetiq order came through from a customer who was only a few hundred metres away from my home. I delivered the game myself, and I met the customer’s brother, who was the concept designer for a publishing company called Chronicle Books. This publisher became the distributor of several of our games in the US.” Similarly, in Belgium, one of Barkat’s friends suggested developing Belgotron, a Belgian version of Helvetiq. In addition to games published in various countries, *Randos Bière en Suisse* will soon have an edition adapted for the US. This international aspect is present even within the company, as the nine-person team speaks eight different languages.

With such a diverse team and concepts, Barkat is excited to work on many projects again. “I always wanted to work on several things at the same time. During my time at EPFL, I was part of several associations, such as Challenge and the Junior Entreprise.” What’s new for Helvetiq? Gastronomy books are about to hit the shelves and a game based on the comedy show *26 minutes* has just come out. “The ideas just keep coming, and the best ones are often the ones we don’t expect.” One could say the same thing about Helvetiq.
Dominique Andrey carried out his military service alongside his studies, attaining the rank of lieutenant by the time he graduated. But he had no plans to pursue a career in the armed forces. “I really liked engineering and civil engineering,” he says. “Back then, I couldn’t see myself pursuing any other path.” He began his career at EPFL’s Institute of Reinforced and Prestressed Concrete in 1980. He was in charge of verifying the viability of road structures—bridges, viaducts and tunnels—upon delivery. After becoming an expert in faulty constructions, he decided to take his studies even further and write a thesis on the subject. He completed his thesis in 1987, and then his career took an unexpected turn: the Swiss army offered him a position as military instructor, with the option of working on military infrastructure in the long term. “I was hesitant for a while,” he says. “When I finally accepted, I promised myself that I’d quit if I didn’t find the work enjoyable. It’s been thirty years, and I’m still here.”

Andrey has held a number of purely military roles throughout his career. After being named captain in 1986, school commander in 1996 and colonel in 1999, he became chief of staff for the Swiss land forces in 2004. He was named personnel director in 2006, and was in charge of recruitment, organisation, transfers and convocations for the Swiss Army’s 200,000 soldiers. The role—which is not unlike that of a human resources director in a civilian setting—was completely new to Andrey, and he always sought to carry out his duties with fairness.

At the end of 2008, he was appointed commander of the Swiss land forces. “I helped prepare the soldiers for real military engagement and oversaw their training,” he says. “I also helped develop policy and equipment. Risk was always a factor. You’re in charge of a lot of people—it’s a huge physical, intellectual and moral responsibility.” At that point, Andrey thought that his next step would be retirement. But in 2016, the head of the Swiss Department of Defence, Civil Protection and Sports, Guy Parmelin, asked him to be his advisor for military affairs. “My job is to give him an overview of the challenges that the army faces, outline the risks and opportunities relating to its use and development and help optimise the management of resources,” says Andrey. “One challenge is striking the right balance in the relationship between Switzerland’s militia system and its fast-changing civilian society. We need to find new ways to reconcile military obligations with academic and professional requirements for young people.”

During his career, Andrey held some of the highest-ranking positions in the Swiss armed forces. Despite the unexpected path his career took, he believes that his studies at EPFL have helped him immensely and he holds his professors in high esteem. “Precision, pragmatism, foresight, risk management—those are all things that I’ve tried to apply throughout my career,” he says. “I always take a systematic approach, like an engineer. And I’ve found it to be very useful.” As he nears the end of his career, Andrey stresses the importance of the human dimension—something he has valued each step of the way. He sums up his philosophy with a quote that he holds dear: “Without individuals, there’s no army.”
For the industry, interns are worth their weight in gold

EPFL students spend several months outside their academic classes working on internships and master’s projects to complete their degree. Companies greatly appreciate this experience—especially companies that hire alumni—which is a valuable source of innovation.

Leaving EPFL to get to know the industry is now a required step before graduating. Students undertake a two- to six-month internship and, depending on their master’s programme, they can also complete a master’s project during their internship (see inset). EPFL has a rigorous selection process when choosing companies for student internships: “We are very focused on the quality of these internships,” says Daniele Mari, director of internships for the Physics department. “We take great care when selecting positions, monitoring students and reviewing their final reports.”

AN ASSET FOR INNOVATION

These requirements don’t hinder companies’ interest in the programme, as companies are impressed with the students’ creativity. “Students have a different perspective on existing problems, in both their approach and their expertise,” says Jean-Michel Chardon (MT’96), senior director at Logitech. Logitech takes about one or two interns per year. “The internships are a wonderful experience for both parties. We spend a month training our interns, but afterwards they are very productive and can tackle areas that we don’t have the internal resources to explore,” says Yanik Tardy (PhD PH’92), vice president of R&D at Dentsply Sirona.

“The best way to transition”

Students say they are also very happy with their internships. During his studies in microtechnology, Luc Conti spent several months at Debiotech in Lausanne. He was thrilled “to be able to work with a team on a real product, in a very concrete way.” Firmin Manoury, an electrical-engineering student, completed his master’s project at Renault in France, in a lab specialised in vehicle connectivity: “The experience confirmed my interest in this specific field. Taking the first steps in the working world while still having the support from an EPFL professor was the best way to transition from my studies to my future career.”

Internships and master’s projects are a way for companies to become involved with EPFL labs. More involved collaborations can then be developed through projects financed by funds from the Commission pour la Technologie et l’Innovation (CTI), which aims to encourage the transfer of knowledge and technology between students and companies.

If your company would like to take on an EPFL student intern, visit http://stages.epfl.ch

INTERNSHIPS AND MASTER’S PROJECTS

Internships at a company allow future engineers to get a taste of the industry for several months. They take place outside the academic environment, but the school must approve the internship.

Master’s projects are a chance for students to apply the skills they learned during their studies. They are closely monitored by a professor. Unlike internships, master’s projects receive a grade. Traditionally, master’s projects were done in a lab. EPFL now offers them in the industry, which brings together research and engineering.
Leïla Ojjeh to take over as head of EPFL Alumni

The alumni department welcomes two new faces. Leïla Ojjeh graduated from EPFL with a degree in Chemistry. She later earned an MBA from INSEAD and served as president of the school’s alumni association for French-speaking Switzerland. She will be replacing Annelies Garcia as head of EPFL Alumni starting this autumn. Emilie Michel (PH’07) took over as head of innovation and external relations in April.

Leïla Ojjeh was born in Rabat and spent her childhood in the Moroccan capital, Delhi and Geneva. After earning a degree in Chemical Engineering from EPFL, she started working at L’Oréal in 1995 and was named head of marketing in Switzerland for the company’s Lancôme brand in 1999. “I’ve always valued diversity, connecting with others and having an impact. That’s what drew me to marketing. L’Oréal was a great learning experience. I quickly learned how to manage a brand, a team and an income statement.”

She then decided to pursue her studies further and earned an MBA from the INSEAD business school in 2001. She was particularly interested in innovation and was hired by Firmenich in 2003, where she held a number of different international roles in business development and B2B innovation in the food industry. “The world of fragrances is fascinating. I loved creating new product concepts and working on things like natural ingredients, sustainable development and technological innovation with R&D.”

The next step in her innovation-oriented career was Fusebox, a platform she launched at EPFL that organises competitions to spark creativity among companies and the EPFL community. “It was a great experience, and it gave me a chance to rediscover EPFL. It was sort of like Back to the Future: the familiar landmarks were still there—like the esplanade and the dome—but the school had changed so much in 20 years! It was amazing to see how much progress the school had made in terms of scientific excellence, campus life and international exposure.”

In 2014 Ojjeh was hired by Dover, a company that specialises in digital printing and traceability. She was in charge of the innovative-inks portfolio and was tasked with exploring new markets.

Married with three children, she has been able to successfully balance her career ambitions with family life. Ojjeh was also involved with INSEAD’s alumni association, serving as president for French-speaking Switzerland from 2012 to 2014. “That’s where I learned just how important and powerful an alumni network can be. I loved organising different events and meetups.” She will become head of EPFL Alumni starting this autumn, and is looking forward to coming back and getting to know the school’s graduates. “EPFL was such a great thing to have on my CV throughout my career. I’m really delighted to be working for this school and its graduates in order to help promote its reputation and support research, education and innovation in Switzerland.”

“EPFL is one of the best universities in the world. Its graduates are ambassadors who play a key role in helping the school grow.” Ojjeh’s goal is to “improve graduates’ sense of belonging in this 30,000-strong international network and turn it into a real community where members help one another and encourage others to get involved. Thank you so much to Annelies Garcia and her entire team for the excellent repositioning work they’ve accomplished over the past few years. I will continue to improve the value proposition for alumni.”
Tell us about your background.
After earning a degree in Physics from EPFL in 2007, I worked as a quantitative analyst for a bank in Geneva called Mirabaud. In 2013, I got a job with the independent asset manager 1875 Finance. On the side, I was involved with EPFL Alumni’s Geneva branch and served as president from 2013 to 2016. I also remained attentive to the world of innovation by following the development of Eargo, a company founded by a close friend in the hearing-aid business.

What does EPFL Alumni offer start-ups founded by graduates?
The school offers a mentoring programme where entrepreneurs can seek advice from three mentors with useful insights into fields such as law, marketing and sales. We also organise an event called Seed Night—a pitch competition for start-ups—every April. The event brings together between 300 and 400 people and is a great networking opportunity for anyone working in innovation.

Lastly, EPFL Alumni works with Business Angels Switzerland to promote investment by inviting graduates to attend several meetings each year where three or four start-ups looking for funding are presented.

In addition to the start-up programmes, you will also collaborate with the Development office to build up a programme for Alumni to be involved in initiatives to advance the school’s priorities. What is at stake in the development of the school?
As you know, EPFL is a publically funded University. However, there are different ways we can team up with the private sector to accelerate emerging fields and leverage the impact for the society. One of the most relevant group for EPFL are our alumni.

We would love to see more alumni being actively involved with our strategic initiatives and becoming partners; as ambassadors to promote EPFL’s vision, as door-openers to access new and important networks, as supporters and new donors to advance strategic priorities in research, education and infrastructure. Supporting EPFL does indeed directly contribute to the prosperity of the Swiss economy and its relevance throughout the world.
Alumnist is distributed along with Technologist, the European science magazine, initiated by EPFL and published by EuroTech Universities.

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Faculty Position in Gene Therapy of the Nervous System

The Faculty of Life Sciences of the Swiss Federal Institute of Technology Lausanne (EPFL) invites applications for a full-time faculty position in the field of gene transfer for the treatment of neurological and sensory-based diseases. Appointments will be considered at the level of tenure-track assistant professor or tenured professor, depending on the qualifications of the applicant.

The successful candidate will develop an independent and dynamic research program, participate in both undergraduate and graduate teaching, and supervise PhD students and postdoctoral fellows. We are seeking candidates with a strong basis in neurological and/or sensory organ diseases, and which are strongly implicated in the development of gene-based therapies for the central nervous system and sensory organs. In particular, a proven track record in gene transfer technologies (AAV, lentivirus, novel vectors), and in state-of-the-art techniques for gene correction (e.g. gene editing) or gene-based intervention (e.g. optogenetics), is of high importance. A strong focus in moving research towards clinical application is required.

The position is offered as part of an initiative to promote research in translational Neuroscience at Campus Biotech in Geneva. The chair will benefit from and provide the academic guidance for the Bertarelli Foundation Gene Therapy Platform, which has the mission to develop and produce viral vectors for therapeutic applications in the field of neurological diseases.

It will be located in an environment of biomedial research, in collaboration with the Center of Neuroprosthetics, the Wyss Center for Neuroengineering, the Human Brain project and local University hospitals, with the aim to foster interdisciplinary thinking for the development of innovative therapies against complex diseases affecting the central nervous system and sensory organs.

Significant start-up resources, research budget and state-of-the-art research infrastructure, including metabolomics, are available. Salaries and benefits are internationally competitive.

Applications should include a cover letter with a statement of motivation, a CV with a list of publications, a concise (3 page) statement of research and teaching interests, the names and contact information of five referees, and should be submitted before September 1st, 2017 to:

https://academicjobsonline.org/ajo/jobs/9105

Enquiries may be addressed to:
Prof. Carmen Sandi
Chair of the Search Committee
bmi-search@epfl.ch

For additional information on EPFL, please consult the web sites:

EPFL is committed to increasing the diversity of its faculty, and strongly encourages women to apply.

Professorship in Cancer Genomics

The School of Life Sciences of the Ecole Polytechnique Fédérale de Lausanne (EPFL) invites applications for a faculty position in the general field of Cancer Genomics. This search is part of major initiatives in the Lake Geneva area to promote research in the fields of Cancer, Personalized Health and Computational Biology. We are primarily seeking highly accomplished mid-career candidates for a full professor position, although in exceptional cases more junior candidates will be considered.

The successful candidate will develop an independent and dynamic research program, participate in both undergraduate and graduate teaching, supervise PhD students and postdoctoral fellows. He/She will also actively contribute to the leadership of EPFL's cancer research institute (ISREC) and EPFL's involvement in the multi-institutional Swiss Cancer Center Lausanne, which brings together EPFL, the Universities of Lausanne and Geneva and clinical departments of the Hospitals of Lausanne and Geneva.

The successful candidate will join a diverse, highly interactive and interdisciplinary biomedical research community. The School of Life Sciences fosters interactions with other relevant domains at EPFL, such as the Schools of Basic Sciences, Engineering, and Information and Communication Technologies. Significant start-up resources, research budget and state-of-the-art research infrastructure are available. Salaries and benefits are internationally competitive.

EPFL as an institution strongly favours open access science. Thus, commitment to open access and data dissemination will be positively valued.

Applications should include a cover letter, a curriculum vitae with a contribution-annotated list of publications, a list of 5 key publications, a synopsis of principal accomplishments, a concise future research statement (3 pages max) and teaching interests, the names and addresses (including e-mail) of five referees, and should be submitted to:

https://academicjobsonline.org/ajo/jobs/9119

Formal evaluation of candidates will begin on October 1st, 2017 and continue until the position is filled.

Enquiries may be addressed to:
Prof. Freddy Radtke
Chairman of the Search Committee
isrec-search@epfl.ch

For additional information on EPFL, please consult the web sites:
www.epfl.ch, sti.epfl.ch and igm.epfl.ch

EPFL is committed to increasing the diversity of its faculty, and strongly encourages women to apply.
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This will be a great occasion to rediscover the amazing science of your School, and to be intellectually challenged with your classmates.

18h00 - Welcome drink at Swisstech Convention Center

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Limited seats 800 attendees

Registration : go.epfl.ch/gala2017