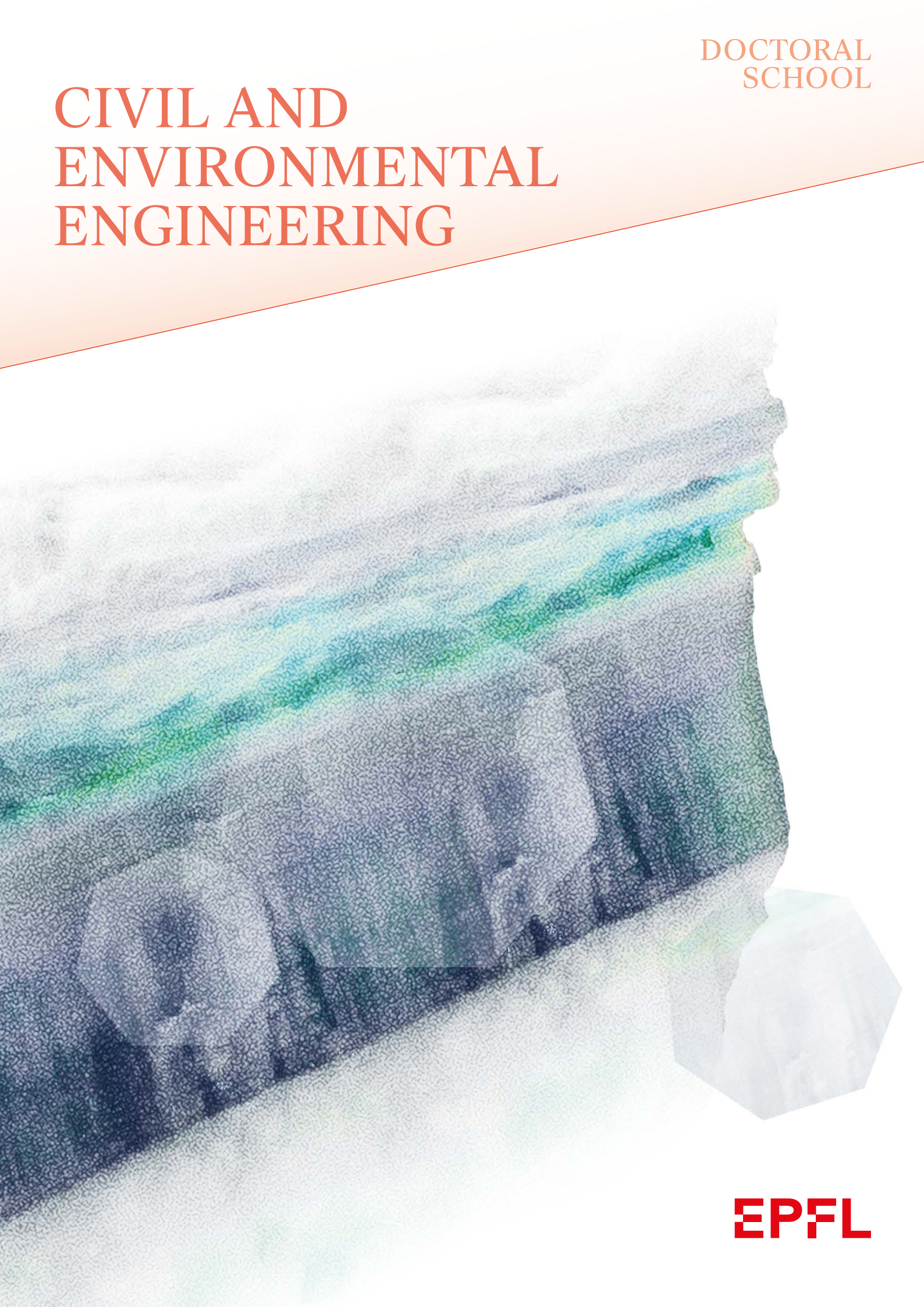
DOCTORAL SCHOOL

CIVIL AND ENVIRONMENTAL ENGINEERING



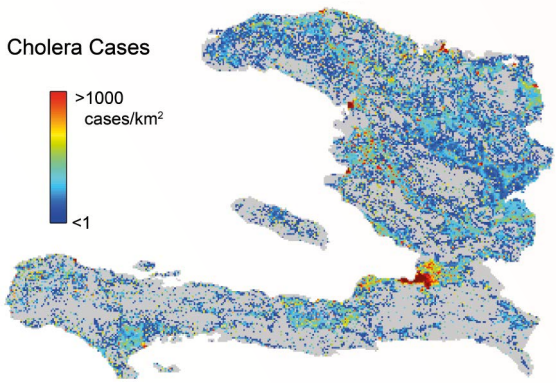
EPFL

The doctoral program in Civil and Environmental Engineering (EDCE) at EPFL is a multidisciplinary program designed to tackle the most challenging problem of our time: fostering a vibrant and productive society while ensuring environmental sustainability.

This challenge is being addressed by creative interactions between science and engineering. The strength of EDCE is that it spans a remarkably broad research spectrum: from rock mechanics to microbiology, from rivers to roads and from the dams to glaciers. EDCE offers the educational model necessary to become a leader in fast-paced, high-tech industries and academia.

Spatial epidemiology of waterborne disease

The Laboratory of Ecohydrology focuses on research at the interface of hydrology, geomorphology and ecology under an integrated framework of analysis with an aim for a general theory. The main effort in the doctoral program is devoted to the development of a new research field across physical and biological sciences: spatial epidemiology of waterborne disease, with significant impacts on science and public health practice. Waterborne diseases are infections that predominantly are transmitted through contact with or consumption of contaminated water. They can strike humans, animals and even plants. Spatially explicit mathematical models of waterborne infections are fast revolutionizing epidemiology as they can provide key insights into the course of an ongoing epidemic, potentially aiding real-time emergency management in allocating resources and anticipating the impact of alternative interventions. We aim at a new generation of spatially explicit multilayer-network models of waterborne epidemics and epizootics. Specifically we study cholera, one of the most important global health hazards, and proliferative kidney disease in salmonids, which has a critical impact on fish stock with major ecological and bio-economic consequences.



Using weather radars to study mountainous and Antarctic snowfall

Snowfall in mountainous regions arises from complex interactions between the large-scale atmospheric flow, the topography and microphysical processes in clouds. This leads to a high spatio-temporal variability of snowfall intensity, which is challenging to forecast. To better represent these interactions in weather models, we need to better understand the processes involved. To do so we use precipitation and cloud radars to study the dynamics and microphysics of mountainous snowfall. During the first two first years of my PhD, I had the chance to take part in three measurement campaigns. The first one was in Valais in the winter 2016-2017. The second one took place in South-Korea during the PyeongChang 2018 Olympic Winter Games, as part of an international experiment. It was a great opportunity for me to discover a new culture and to compare measurements we did in the Swiss Alps with the Taebaek mountains in Korea.

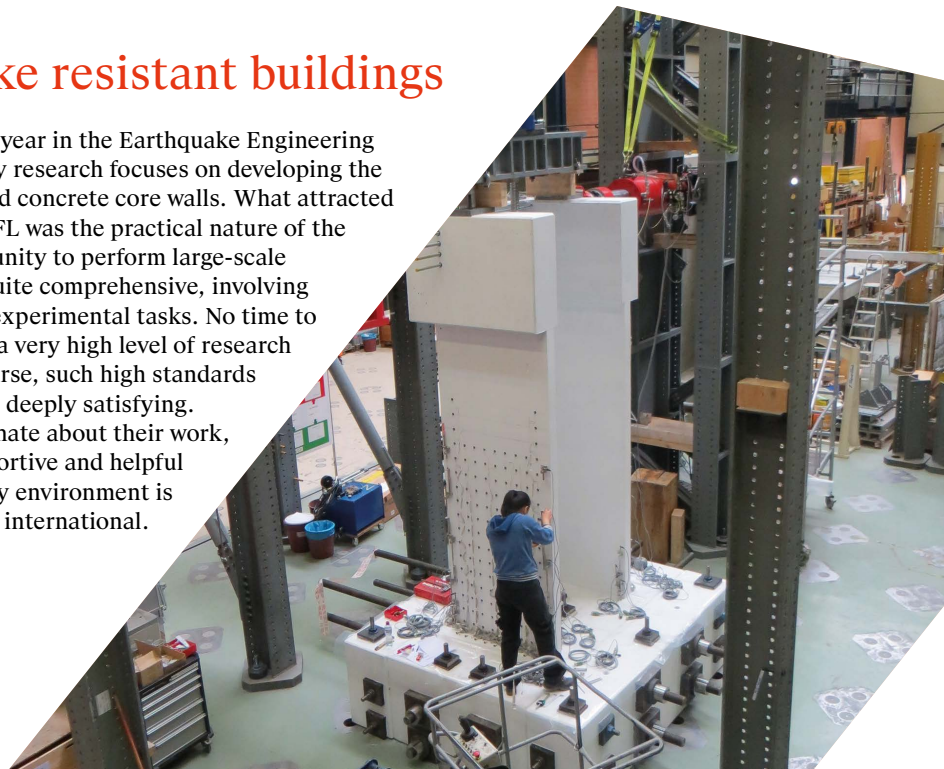
Josué Gehring,
PhD student

Another region of interest for my PhD is Antarctica. Snowfall is the main input for the ice sheet and it is crucial to better understand precipitation processes in Antarctica to monitor and forecast changes due to global warming. The third field campaign of my PhD took place in Davis station in East Antarctica. We are interested in particular effects which take place at the coast of Antarctica, such as snowfall sublimation by the dry katabatic winds that are blowing from the interior of the continent towards the coast. This was a great opportunity to work in a scientific research station in Antarctica and collaborate in an international project. Now that I collected so many data from different parts of the world, my work focuses on the analysis of those. In particular I am investigating which meteorological conditions lead to intense snowfall and how they affect the growth of ice crystals in clouds. My PhD is very enriching because of the variety of the work: from field campaigns to data analysis and presentation at international conferences, it is definitely the project I was looking for!

Raluca Tereza Constantin,
PhD student

Designing earthquake resistant buildings

Currently I am a PhD student in my third year in the Earthquake Engineering and Structural Dynamics Laboratory. My research focuses on developing the seismic design guidelines for reinforced concrete core walls. What attracted me very much to this topic and to EPFL was the practical nature of the research topic as well as the opportunity to perform large-scale testing. Moreover, the project is quite comprehensive, involving numerical, analytical, as well as experimental tasks. No time to get bored. I have profited from a very high level of research and education at EPFL. Of course, such high standards require a lot of work, but it is deeply satisfying. People here are very passionate about their work, and at the same time supportive and helpful with yours. The university environment is really collaborative and international.



Career opportunities

Approximately 40% of EDCE graduates hold positions in academia or research institutions. The other 60% work in governmental agencies, NGOs, in established civil and environmental engineering firms or even found their own start-up companies.

Application deadlines

EDCE accepts complete application dossiers three times a year: **January 15th, April 30th and September 15th.** Changes to the application deadlines may apply. For the most recent information, please refer to the program's webpage.

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Administrator: **Emma Sorrentino**

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Civil Engineering	
Prof. Thomas KELLER	Composite Construction Laboratory – CCLAB
Dr. Anastasios VASSILOPOULOS	Composite Construction Laboratory – CCLAB
Prof. Jean-François MOLINARI	Computational Solid Mechanics Laboratory – LSMS
Prof. Katrin BEYER	Earthquake Engineering and Structural Dynamics Laboratory – EESD
Dr. Pierino LESTUZZI	Earthquake Engineering and Structural Dynamics Laboratory – EESD
Prof. Christophe ANCEY	Environmental Hydraulics Laboratory – LHE
Prof. Brice LECAMPION	Geo-energy Laboratory – Gaznat Chair on Geo-energy – GEL
Prof. Dusan LICINA	Human-Oriented Built Environment Lab – HOBEL
Prof. Yves WEINAND	Laboratory for Timber Constructions – IBOIS
Prof. Marie VIOLAY	Laboratory of Experimental Rock Mechanics – LEMR
Prof. Dimitrios LIGNOS	Resilient Steel Structures Laboratory – RESSLab
Prof. Alain NUSSBAUMER	Resilient Steel Structures Laboratory – RESSLab
Prof. Lyesse LALOUI	Soil Mechanics Laboratory – Chair "gaz naturel" Petrosvibri – LMS
Prof. Jean-Louis SCARTEZZINI	Solar Energy and Building Physics Laboratory – LESO
Prof. Aurelio MUTTONI	Structural Concrete Laboratory – IBETON
Dr. Miguel FERNÁNDEZ RUIZ	Structural Concrete Laboratory – IBETON
Prof. Eugen BRÜHWILER	Structural Maintenance and Safety Laboratory – MCS
Dr. Emmanuel DENARIÉ	Structural Maintenance and Safety Laboratory – MCS
Prof. Dolaana KHOVALYG	Thermal Engineering for the Built Environment Laboratory – TEBEL
Prof. Michel BIERLAIRE	Transportation and Mobility Laboratory – TRANSP-OR
Prof. Nikolaos GEROLIMINIS	Urban Transport Systems Laboratory – LUTS
Prof. Alexandre ALAHI	Visual Intelligence for Transportation – VITA

Environmental Engineering	
Prof. Alcherio MARTINOLI	Distributed Intelligent Systems and Algorithms Laboratory – DISAL
Prof. David Andrew BARRY	Ecological Engineering Laboratory – ECOL
Prof. Tamar KOHN	Environmental Chemistry Laboratory – LCE
Prof. Devis TUIA	Environmental Computational Science and Earth Observation Laboratory – ECEO
Prof. Rizlan BERNIER-LATMANI	Environmental Microbiology Laboratory – EML
Prof. Alexis BERNE	Environmental Remote Sensing Laboratory – LTE
Prof. Julia SCHMALE	Extreme Environments Research Laboratory – Ingvar Kamprad Chair – EERL
Prof. Bertrand MERMINOD	Geodetic Engineering Laboratory – TOPO
Dr. Jan SKALOUD	Geodetic Engineering Laboratory – TOPO
Prof. François GOLAY	Geographic Information Systems Laboratory – LASIG
Dr. Stéphane JOOST	Geographic Information Systems Laboratory – LASIG
Prof. Anders MEIBOM	Laboratory for Biological Geochemistry – LGB
Prof. Christof HOLLIGER	Laboratory for Environmental Biotechnology – LBE
Prof. Urs VON GUNTEN	Laboratory for Water Quality and Treatment – LTQE
Prof. Athanasios NENES	Laboratory of Atmospheric Processes and their Impacts – LAPI
Dr. Satoshi TAKAHAMA	Laboratory of Atmospheric Processes and their Impacts – LAPI
Prof. Michael LEHNING	Laboratory of Cryospheric Sciences – CRYOS
Prof. Andrea RINALDO	Laboratory of Ecohydrology – ECHO
Prof. Kristin SCHIRMER	Laboratory of Environmental Toxicology – TOX
Prof. Claudia BINDER	Laboratory on Human-Environment Relations in Urban Systems – HERUS
Prof. Johny WÜEST	Physics of Aquatic Systems Laboratory – Margaretha Kamprad Chair – APHYS
Prof. Charlotte GROSSIORD	Plant Ecology Research Laboratory – PERL
Prof. Johan GAUME	Snow Avalanche Simulation Laboratory – SLAB
Prof. Christian LUDWIG	Solid Waste Treatment – GR-LUD
Prof. Tom BATTIN	Stream Biofilm and Ecosystem Research Laboratory – SBER
Prof. Fernando PORTÉ-AGEL	Wind Engineering and Renewable Energy Laboratory – WIRE

Architectural and Urban Engineering	
Prof. Philippe THALMANN	Laboratory of Environmental and Urban Economics – LEURE
Prof. Marilyne ANDERSEN	Laboratory of Integrated Performance in Design – LIPID
Prof. Corentin FIVET	Structural Exploration Laboratory – SXL
Dr. Jérôme CHENAL	Urban and Regional Planning Community – CEAT
Prof. Vincent KAUFMANN	Urban Sociology Laboratory – LASUR