Franca Schmid

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University of Bern

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Research interests

Cerebral blood flow
Numerical modeling
Vascular networks
Hemodynamics
Fluid dynamics
Metabolism
Biological flows and transport
Biomedical imaging
Neurodegenerative diseases

Employment history

07/2022 - present **Group Leader | SNF Ambizione Fellow**
ARTORG Center for Biomedical Engineering Research, University of Bern, Switzerland.
(*80% due to care duties*)

03/2023 – 06/2023 **Visiting Researcher,**
Chair: Nicolas Renier, Laboratory of Structural Plasticity, ICM Brain and Spine Institute, Paris, France.

09/2020 – 03/2022 **Postdoctoral Researcher**,
Chair: Prof. Patrick Jenny, Institute of Fluid Dynamics, ETH Zurich, Switzerland.

10/2019 – 11/2019 **Visiting Researcher,**
Chair: Prof. Rainer Helmig, Institute for Modeling Hydraulic and Environmental Systems, University of Stuttgart, Stuttgart, Germany.

09/2017 – 08/2020 **Postdoctoral Researcher**,
Chair: Prof. Bruno Weber, Institute of Pharmacology and Toxicology, University of Zurich, Switzerland.

11/2012 – 06/2017 **Research Assistant**,
Chair: Prof. Patrick Jenny, Institute of Fluid Dynamics, ETH Zurich, Switzerland.

Education

11/2012 – 06/2017 **PhD in Mechanical Engineering**,
Institute of Fluid Dynamics, ETH Zurich, Switzerland
Thesis title: *Cerebral blood flow modeling with discrete tracking of red blood cells - analyzing microvascular networks and their perfusion.*
Supervisor: Prof. Patrick Jenny, Defense date: June 15, 2017

10/2006 – 07/2012 **Mechanical Engineering, Diploma** (equivalent to M.Sc.)
University of Stuttgart, Germany, Grade: 1.4 (*excellent)*

Approved research projects

02/2025 – 02/2027 **Fondation Pierre Mercier pour la Science**, Switzerland
2-year research project. Salaries and project funds (CHF 240'000)
Title: *Vascular mural cells: key players for the brain's energy supply – in silico approaches to quantify their regulatory relevance in health and disease.*

07/2024 – 12/2024 **Hartmann Müller - Stiftung**, University of Zurich, Switzerland
0.5-year research project. Salaries (CHF 30'300)
Title: *Leptomeningeal collaterals during stroke – quantitative insights from blood flow modeling in whole brain vascular networks.*
Joint application with Prof. Susanne Wegner (University Hospital Zurich, Switzerland).

07/2022 – 06/2026	**SNF Ambizione Fellow**, University of Bern, Switzerland 4-year research project. Salaries and project funds (CHF 918'480) Title: *Energy supply in whole brain microvascular networks in health and disease – quantifying the relevance of small-scale disturbances.*
08/2019 – 08/2020	**Forschungskredit Postdoc**, University of Zurich, Switzerland 13-month research project. Salary and expenses (CHF 125'274) Title: *In-depth characterization of the brain microvasculature focusing on layer-specificity in topology, perfusion and nutrient supply.*
10/2019 – 11/2019	**GRC Travel Grant**, Graduate Campus, University of Zurich, Switzerland Two-month research stay. Matching fund for travel and living costs (CHF 2'000) Title: *Oxygen discharge from one-dimensional red blood cells to tissue.*

Publications & presentations - summary

Publications	14 publications (including: 1 last author, 5 first author and, 1 review) all in Q1 journals with impact factors ranging from 4.5-18.7. Resulting in a total of 691 citations with a steadily increasing number of citations per year. The full publication is available in a separate document.
Presentations	19 invited talks at international conferences and workshops. 17 conference contributions. 7 seminar presentations.

Teaching activities

Since 2018	Class on *Blood flow modeling in the microcirculation* (part of the lecture *Biofluid dynamics*). Master level (~30 students). ETH Zurich, Switzerland.
01/2019	Guest lecture on *Blood flow modeling in the microcirculation,* University of Stuttgart, Germany.
09/2013 – 03/2016	Teaching assistant for *Computational Methods for Flow, Heat and Transport problems*. Bachelor level (~60 students). ETH Zurich, Switzerland.
09/2013 – 07/2016	Teaching assistant for *Computational Fluid Dynamics with OpenFOAM.* Bachelor level (~30 students). ETH Zurich, Switzerland.

Leadership & management experience

05/2025 - present	Deputy Representative of the Intermediate Staff Association in the **Commission for the Promotion of Early Career Researchers**. University of Bern.
11/2024	Course on **Essentials for teaching in higher educations** (2 days), University of Bern.
07/2022 - present	**Group leader** including personnel, budget, and reporting responsibilities.
2013 - present	**Supervision** of 3 PhD, 13 undergraduate and graduate students and 6 student assistants (for details see below).
06/2023 – 02/2024	**COMET** – career program – including workshops on Leadership and Time management, University of Bern.
02/2023	Training for **PhD Supervisors** (2 days), University of Bern.

Invited talks

09/2025	*ConFlowNet2025 conference*. Raitenhaslach. Germany.
05/2025	*European Society for Microcirculation – Biennial Meeting*. Szeged. Hungary.
04/2025	Webinar for the *Interpore Academy.*
03/2025	PhD advanced course on *Neurovascular and Neurometabolic Regulation in Health and Disease*. University of Coimbra. Portugal.
12/2024	Workshop on *Brain Microcirculation | Aarhus CTH Workshop*. Aarhus. Denmark.

11/2024	11th International Symposium on Neuroprotection and Neurorepair. Potsdam. Germany
10/2024	Workshop on *Image processing, modelling of porous media flow and parameter estimation in medicine and geo-sciences.* UHnett Vest workshop. Ullensvang. Norway.
03/2024	PhD advanced course on *Neurovascular Unit: Structure and Function in Health and Disease*. University of Coimbra. Portugal.
09/2022	Workshop on *Bridging the Gap: from Brain Mechanics to Brain Dynamics*. Lorentz Center. Leiden. Netherlands.
05/2022	Educational Course on *Cutting-edge technologies for understanding cerebral microcirculation functions*. 30th International Symposium on Cerebral Blood Flow, Metabolism and Function. Glasgow. UK.
05/2022	Online educational pre-workshop on *Bridging the Gap: from Brain Mechanics to Brain Dynamics*. Lorentz Center. Leiden. Netherlands.
05/2022	Online workshop on *Microrheology and Transport in Complex Biological Media*. Institute of Physics (IOP). London. UK.
11/2021	Webinar on *Small and mighty: Brain capillaries in Health and Disease*, Frontiers in Molecular Neuroscience - Research topic.
07/2020	Webinar on *Numerical Modeling Applications in Fluid Dynamics and Solid Mechanics*. Lingaya's Vidyapeeth. Faridabad. India.
11/2019	Workshop on *Modeling flow in live tissues* at the University of Bergen. Bergen. Norway.
09/2019	American Physiological Society Conference on *The Interface of Mathematical Models and Experimental Physiology: Organ Function from the Microvascular Perspective*. Scottsdale. USA.
07/2019	ISCBFM-sponsored Satellite Symposium on *Advances in Multi-Scale Imaging of Cerebral Blood Flow and Metabolism in relation to Brain Activity*. Suwon. South Korea.
09/2018	11th World Congress for Microcirculation. Vancouver. Canada.
10/2017	Workshop on *fNIRS: use and perspective in rehabilitation*. Fondazione Don Carlo Gnocchi. Milan. Italy.

Conference participations

09/2025	Dreiländertagung Biomedical Engineering. Muttenz. Switzerland. (*oral presentation*)
07/2025	30th Congress of the European Society of Biomechanics. Zurich. Switzerland. (*oral presentation*)
09/2023	12th World Congress for Microcirculation. Beijing, China. (*oral presentation, online*)
04/2023	22nd Computational Fluids Conference. Cannes. France. (*oral presentation*)
05/2022	30th International Symposium on Cerebral Blood Flow. Metabolism and Function. Glasgow. UK. *(poster & flash presentation)*
05/2021	Interpore 2021. 13th Annual Meeting. Virtual Conference. (*oral presentation*)
11/2020	73rd Annual Meeting of the APS Division of Fluid Dynamics. Virtual Conference. (*oral presentation*)
07/2019	29th International Symposium on Cerebral Blood Flow, Metabolism and Function. Yokohama. Japan. (*poster & poster chair*)
05/2019	Interpore2019. 11th Annual Meeting. Valencia. Spain. (*poster*)
10/2018	2nd Swiss Vascular Research Symposium. Lugano. Switzerland. (*oral presentation & poster chair*)
12/2017	School of Brain Cells & Circuity *Camillo Golgi.* Erice. Italy. (*oral presentation*)
10/2017	Blood flow: Current state and prospects. Paris. France. (*poster*)
04/2017	28th International Symposium on Cerebral Blood Flow, Metabolism and Function. Berlin. Germany. (*oral presentation*)

07/2016	44th Annual Meeting of the International Society of Oxygen Transport to Tissue. Chicago. USA. (*oral presentation*)
06/2015	27th International Symposium on Cerebral Blood Flow, Metabolism and Function. Vancouver. Canada. (*oral presentation*)
12/2014	Aarhus CTH Meeting. Aarhus. Denmark. (*poster*)
06/2014	42nd Annual Meeting of the International Society of Oxygen Transport to Tissue. London. UK. (*poster*)

Seminar presentations

11/2024	Research Unit FOR 2688 Instabilities, Bifurcations and Migration in Pulsating Flow, Saarbrücken, Germany. (*online*)
04/2024	Biological Physics and Morphogenesis. TU München. Germany.
06/2023	Seminaire du Vendredi, Paris Brain Institute – ICM. Paris. France.
01/2023	CBBM-Lecture, Center of Brain, Behavior and Metabolism. University of Luebeck. Germany.
09/2019	Medical Flow Physics Laboratory. University of Southern California. USA.
01/2019	Department of Hydromechanics and Modeling of Hydrosystems. University of Stuttgart. Germany.
10/2018	Laboratory of Neurophysiology and New Microscopy. Université Paris Descartes. France.

Conference participations of PhD students

09/2025	20th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering | CMBBE. Barcelona. Spain. (CL & GS, *both oral presentations, best student presentation price for GS*)
12/2024	Workshop on *Brain Microcirculation | Aarhus CTH Workshop*. Aarhus. Denmark. (CL & GS, *both poster presentations*)
06/2024	8th International Conference on Computational and Mathematical Biomedical Engineering | CMBE24. Arlington. Virginia. USA (CL & GS, *both oral presentations*)
05/2024	10th European Stroke Organization Conference. Basel. Switzerland. (CL, *poster presentation*)
04/2023	9th European Stroke Organization Conference. Munich. Germany. (CL, *poster presentation*)
09/2022	30th International Symposium on Cerebral Blood Flow. Metabolism and Function. Glasgow. UK. (RE, *poster presentation*)
06/2021	Interpore 2021. online. (RE, *oral presentation*)
11/2020	APS Division of Fluid Dynamics. 73rd Annual Meeting. online. (RE, *oral presentation*)
07/2019	29th International Symposium on Cerebral Blood Flow, Metabolism and Function. Yokohama. Japan. (RE, *poster presentation*)
05/2019	Interpore 2019. Valencia. Spain (RE, *oral presentation*)
09/2018	11th World Congress for Microcirculation. Vancouver. Canada (RE, *poster presentation*)

CL: Chryso Lambride, GS: Gaia Stievano, RE: Robert Epp

Reviewing, panel membership & PhD committee member

01/2025	**Co-Initiator** of the monthly *Neurovascular-youngPI-meetUp*
01/2025	**Member of the prize jury** for the Annual Meeting of the Cardiovascular Research Cluster. Bern. Switzerland.

09/2024	**Organizing committee member** for MAP Young Faculty Meeting 2024. scnat network. Bern. Switzerland.
11/2023	**PhD committee member** for David Pastor Alonso, Project: *Modeling blood-tissue exchanges in the brain microcirculation* (supervised by Sylvie Lorthois and Yohan Davit). INP Toulouse. France.
05/2022	**Co-chair** of educational Course on *Cutting-edge technologies for understanding cerebral microcirculation functions* at 30th International Symposium on Cerebral Blood Flow. Metabolism and Function. Glasgow. UK.
09/2019	**Co-chair** of session *Brain Microcirculation* at the American Physiological Society Conference on *The Interface of Mathematical Models and Experimental Physiology: Organ Function from the Microvascular Perspective*. Scottsdale. USA.
05/2019	Member of students and early career researchers' **discussion panel** for professorial candidates at the Institute of Fluid Dynamics, ETH Zurich.
06/2017 - present	**Reviewing for scientific journals** (eLife, NeuroImage, Nature communications, Neuron, PNAS, Neurophotonics).

Scientific outreach

09/2025	*Nacht der Forschung* (Night of research). University of Bern. Switzerland.
06/2024	*Interview Berner Anzeiger.* University of Bern. Switzerland.
12/2023	*Open door* at sitem-insel. University of Bern. Switzerland.
04/2023	*Diverse Teams @ARTROG*. University of Bern. Switzerland.
02/2023	*Women in Science Day*. University of Bern. Switzerland.
09/2022	*Nacht der Forschung* (Night of research). University of Bern. Switzerland.

Memberships in scientific societies

05/2024 - present	ALBA Network
05/2024 - present	Swiss Society of Neuroscience (SSN)
10/2022 - present	Cerebrovascular Research Network (CARNet)
07/2022 - present	Cardiovascular Research Cluster Bern (CVRC)
08/2022 - present	Swiss Society for Microcirculation and Vascular Research (SSMVR)
06/2015 - present	International Society of Cerebral Blood Flow and Metabolism (ISCBFM)

Travel grants

05/2022	Early Career Investigator Travel Bursary ($ 800) at 30th International Symposium on Cerebral Blood Flow, Metabolism and Function. Glasgow. UK.
07/2019	Early Career Investigator Travel Bursary (USD 1'390) at 29th International Symposium on Cerebral Blood Flow, Metabolism and Function. Yokohama. Japan.
04/2017	Early Career Investigator Travel Bursary (EUR 650) at 28th International Symposium on Cerebral Blood Flow, Metabolism and Function. Berlin. Germany.

Supervision of PhD students

11/2022 - present	Gaia Stievano, *Modeling of oxygen transport in realistic microvascular networks – Studying the impact of perfusion heterogeneities and microvascular alterations.*
06/2022 - present	Chryso Lambride, *In silico modeling of reperfusion dynamics after ischemic stroke and during treatment.* Joint supervision with Prof. Susanne Wegener (University Hospital Zurich).

10/2016 – 12/2022	Robert Epp, *Inverse model for bi-phasic blood flow in the microcirculation*. Co-Supervision. Main supervisor: Prof. Patrick Jenny (ETH Zurich).

Supervision of graduate & undergraduate students

12/2025 – 05/2026	Dominic Campbell-Pitt (Master student). Project: *Impact of mass transfer coefficients on oxygen transport in microvascular networks.* (Co-Supervision with GS)
10/2025 – 03/2026	Ana Barrio (Master student). Project: *The impact of regional brain vascular architectures (cortex vs hippocampus) on oxygen transport and delivery.* (Co-Supervision with GS)
09/2025 – 12/2025	Tim Eicher (Master student). Project: *Computational blood flow modelling in arterial whole brain vascular networks.* (Co-Supervision with CL)
03/2025 – 08/2025	Giorgia Barra (Master student). Project: *Quantification of the impact of mass transfer coefficients on oxygen transport in microvascular networks.* (Co-Supervision with GS)
03/2025 – 08/2025	Emilio Zorzi (Master student). Project: *Quantification of the role of local vascular topologies on oxygen delivery.* (Co-Supervision with GS)
11/2024 – 04/2025	Ketan Gupta (Master student). Project: *Differentiation of surface and penetrating vessels in arterial vascular whole brain data sets.* (Co-Supervision with CL)
08/2024 – 01/2025	Manuel Fernandez Lopez (Master student). Project: *Implementation of optimized bi-phasic blood flow model for realistic microvascular networks (microBlooM).*
08/2023 – 01/2024	Javier Tejeda Chas (Master student). Project: *Numerical modeling of microvascular flow in small realistic microvascular networks in case of single capillary occlusions.*
05/2023 – 12/2023	Artemisia Sarteschi (Internship). Project: *Implementation of bi-phasic blood flow model for microvascular flow and application in simulation study (microBlooM).*
09/2022 – 12/2022	Pushkin Nagpure (Master student). Project: *Quantifying the impact of the number of constraints on the solution of inverse problems in the context of microvascular blood flow.*
02/2021 – 08/2021	Marco Heim (Master student). Project: *Reperfusion dynamics in microvascular networks with and without collaterals.*
02/2020 – 08/2020	Luke Prakash Idiculla (Master student). Project: *Quantifying oxygen partial pressure heterogeneity within individual red blood cells.*
02/2019 – 10/2019	Alexander Held (Master student). Project: *Automation & optimization of algorithms to compute the red blood cell velocity from two-photon microscopy images.*
02/2019 – 08/2019	Giulia Conti (Master student). Project: *Investigating the effect of microstrokes on the perfusion of the cortical microvasculature*.
04/2018 – 06/2020	Five student assistants (Master students). Project: *Manual segmentation of microvascular networks acquired by two-photon imaging as training data for automated image segmentation based on machine learning.*
09/2016 – 12/2016	Felix Thaler (Master student). Project: *Optimization of artificial capillary beds to obtain a high degree of well-balancedness*.
02/2016 – 06/2016	Sophie Lohmann (Master student). Project: *Optimization of artificial capillary beds to obtain a high degree of well-balancedness*.
02/2015 – 06/2015	Alexander Garbin (Master student). Project: *Construction of 3D artificial vascular networks & investigating possible vascular mechanisms during neuronal activation.*
02/2015 – 06/2015	Edoardo Rossi (Master student). Project: *Validation of discrete RBC model to simulate the flow in the cerebral vasculature during baseline and activation*.
02/2013 – 05/2013	Robert Knell (Bachelor student). Project: *Experimental investigation of the distribution of red blood cells in simplified capillary networks.*

CL: Chryso Lambride, GS: Gaia Stievano,