

DR. RALF KAEGI, CURRICULUM VITAE

(ORCID: 0000-0002-2430-4733)

Address

Private address: Glaubtenstrasse 59
CH-8046 Zürich
Phone: +41 43 343 1167
Work address: Eawag
Process Engineering
Ueberlandstrasse 133, LA-B17
CH-8600 Dübendorf
Phone: +58 765 52 73
E. Mail: ralf.kaegi@eawag.ch



Education

2000 Ph.D., Institute for Mineralogy and Petrology, ETH Zürich
1996 Diploma (M.S.), Earth Sciences at University of Basel
1990 Matura (College), Type (C) (Mathematics), Switzerland

Employment History

Feb 06 – today Research Scientist, Head of the Particle Laboratory at the Eawag.

Feb 01 – Feb. 06 Research scientist at Empa (Swiss Federal Institute for Materials Science and Testing)

Oct 96 – Dec 00 Graduate Research Assistant, Institute for Mineralogy and Petrology, ETHZ

Research Interests

- Fate and transformation of metals (REEs, nanoparticles) and plastics in urban wastewater systems
- Development of new analytical methods for microplastics and nanoparticle detection
- Characterization of the structure of environmental colloids and particles using microscopic and spectroscopic methods

Approved research projects

- SNF: 200021_165911: Fate of Engineered Nanoparticles During Sewage Sludge Combustion and Mobilization From Sewage Sludge Ashes (PhD project, 2016 - 2019)
- SNF: 406440_131277: Behaviour of silver nanoparticles in a wastewater treatment plant (PhD project, 2011 - 2015)
- SNF: 200021_129728 (200020_152802), Fundamental and Applied Studies of Nanoparticle Detection using LIBD / LIBS (Laser Induced Breakdown Detection / Spectroscopy) (PhD project, jointly supervise with Prof. Detlef Günther (ETHZ), 2011 - 2014)
- EU-H2020: EUROqCHARM - EUROpean Quality Controlled Harmonisation Assuring Reproducible Monitoring and assessment of plastic pollution - Grant Agreement pending (part time employment of a research assistant, 3 years, 2020 - 2023)
- EU-H2020: Nanomaterial Fate and Speciation in the Environment — NanoFASE, Grant Agreement number: 646002 (4 years postdoc position, 2015 – 2019)
- EU-FP7: Project full title: " Development of an integrated approach based on validated and standardized methods to support the implementation of the EC recommendation for a definition of nanomaterial ". NanoDefine, Grant agreement no: 604347 (4 years postdoc position, 2013 – 2017)
Bafu: Machbarkeit zur Quantifizierung von Mikroplastik in Deponieabwasser (00.5002.PZ / 7ACB640C9, 2023 – 2024)
- Bafu: Mikroplastik in Schweizer Abwasserreinigungsanlagen (MICHARA) (No: 20.0093.PJ / C3DDE1CBA, 2021 – 2025)
- Bafu: Machbarkeit zur Quantifizierung von Mikroplastik in Fliessgewässern und Sedimenten. (No: 06.0074.PZ / B74541A19, 2021 – 2022)
- Bafu: Machbarkeit der Quantifizierung von Mikroplastik in Klärschlamm (No: 19.0011.PJ / 13E464FD9, 2019 - 2020)

- Bafu: Quantifizierung des anthropogenen Anteils von Cer in Klärschlämmen (No: 19.0011.PJ / 483B2BA2E, 2019)
- AWEL: Screening of REE in wastewater treatment plant effluents and in surface water in the Canton of Zuerich (mutual agreement without contract, total volume: CHF: 20'000)
- Stiftung Ostschweizer Kinderspital: Development of a method to quantify microplastic particle in infant stool (mutual agreement without contract, total volume: CHF: 20'000)

Supervision of junior researchers

- Steffen Kaiser (Master), Serge Mueller (Master), Christine Wenk (Master), Olivia Hausherr (Bachelor), Livia Cabernet (Bachelor), Tatjana Schellenberg (Bachelor)
- Guillaume Croset (PhD, ongoing), Ronny Loronzo (PhD), Basilius Thalmann (PhD), Jonas Wielinski (PhD), Narain Astha (Co-PI, ongoing), Angelique Moraz (Co-PI, ongoing), Matteo Bonalumi (Co-PI), Anna Senn (Co-PI)
- Christopher Latkoczy (Postdoc), Toni Uusimäki (Postdoc), Alexander Gogos (Postdoc), Gerardo Pulido-Reyes (Postdoc)

Affiliation with professional societies

Swiss Society for Optics and Microscopy (SSOM), International Water Association (IWA), Society of Environmental Toxicology and Chemistry (SETAC), Swiss Chemical Society

Management Committee:

- Member of the management committee of the IWA specialist group: 'Nano and water, Nanotechnology for the water sector' (2009 – present, Chair: 2012 – 2014)
- Chair of the Norman WG4: 'Engineered nanoparticles in the environment' (2012 – present)
- Swiss delegate in the management committee of COST action ES1205: 'Engineered Nanomaterials - from wastewater Treatment & StormwatEr to Rivers? (ENTER)' (2012 – 2017).
- Chair of the Cost action ES1205, WG2: Behavior of engineered nanoparticles in the environment. (2012 – 2017)

Conference and workshop (WS) organization

2024:

- Microplastic-CH- 5th meeting – 22.03.2024 at ALOPLE – EPFL Valais Wallis – Sion
- INFRAMES fall and EU/US CoRs meeting: scaling up, Pilot study, 16.10. – 18.10.2024 – Eawag
- AK-Basiskurs B33/24: Polymere in der Umwelt – Vorkommen, Analytik, Effekte, Lösungen. Organizer and presenter
- Session 'Lower Micron and Nanosize Plastics: Challenges, Analytical Methods, Occurrence, Composition, Local Sources, Long-Range Transport and Human Exposure', SETAC Europe 34th Annual Meeting, Seville, Spain, 2024, Co-convener
- Swiss Chemical Society – Chair of analytical sciences session, SCS fall meeting, 05.09.2024, Fribourg

2023:

- Microplastic-CH- 4th meeting, March, 2023, Empa Dübendorf, CH
- Challenges in Quality Assurance and Quality Control of Micro- and Nanoplastics Analysis, Silvia Lacorte Bruguera, Ralf Kaegi and Thomas Bucheli, Satellite workshop at the ICCE (June 2023).

2022:

- Microplastic-CH: 3rd meeting, May, 2022, Fribourg, CH
- Microplastics 2022, 06. – 11.11.2022, Monte Verita, Ascona, CH (Co-PI)
- Swiss Nano Convention, 05.-06.07.2022, Fribourg, CH: Swiss Plastic Policy Solutions for Sustainable Use (Podium Discussion Leader)

2019

- Microplastic-CH: 2nd meeting, November, 2019, Bern, CH
- Microplastic-CH: 1st meeting, February, 2019, Zuerich, CH
- PEAK-Basiskurs B27/19: Spurenelemente in der Umwelt – Aktuelle Themen aus Forschung und Praxis: Co organizer and presenter

2018

- Nano- and microplastics in technical and freshwater systems. Monte Verita, 28. – 31.1.2018
- NORMAN Workshop on Microplastic, 24.01 – 25.01.2018, Eawag

2017

- NanoDefine (FP7), Introduction to electron microscopy, sample preparation for electron microscopy, practicals and hands on training. Summer School, 21.-23.06.2017, RIKILT Wageningen University & Research), The Netherlands.
- Monte Verita conference : NanoImpact (Co-PI with Prof. Bernd Nowack)
- Nanoparticles and Microplastics: Harvesting Recent Findings to Fertilize a New Pressing Topic. 07-11.2017 2017, Brussels, Belgium, Convener.

2016

- Session, Detection, identification and quantification of engineered (nano)materials in complex matrices. SETAC Nantes, 2016, Co-convener

2015

- Session 'Leaving the comfort zone. The challenge of measuring nanoparticles in complex matrices.', SETAC Barcelona, 2015, Co-convener
- Session 04e: 'The Biogeochemistry of Rare Earth Elements and Other Critical Metals: From Exotic Trace Elements to Emerging Inorganic Contaminants', Goldschmidt, Prague, 08.2015, Co-convener

2014

- COST workshop: 'Release of nanomaterials from landfills', eawag, 11.2014 (organizer)
- Session 'Detection and characterisation of nanomaterials in complex aqueous matrices', SETAC Basel, 2014 (Co-convener)
- Nanoworkshop (WWC, Lissabon): 'Nano and Water: Applications, Implications and Analytical Needs), 09.2014, organizer

2013

- IWA Symposium on Environmental Nanotech., Nanjing, China, 2013 (program committee)
- 8th International Conference on the Environmental Effects of Nanoparticles and Nanomaterials. Aix en Provence, France, 2013 (scientific committee)
- Micropol & Ecohazard Conference, Zürich, CH, 2013 (organization committee).
- Session 18I: Environmental Application of Engineered Nanomaterials: Benefits and Risks, Goldschmidt Conference, Florence, Italy, 2013 (Co-convener)

2012

- Workshop organizer 'Engineered nanoparticles in the environment' NORMAN WG4; Zurich 18. – 19.10.2012

2011

- Conference chair of the IWA specialist conference: 'Nano and water, Nanotechnology for the water sector', 15.05. – 18.05.2011, Monte Verita, Switzerland (Organiser)

Short courses:

- NanoDefine (FP7) workshop (Vienna, A): 'Electron Microscopy - principal, field of application related to NM analysis, advantages and disadvantages' , 04.2015
- InterNano Spring school (Landau, D): Short course on 'Electron Microscopy', 03.2014 (4h)
- Brazilian Congress of Chemical Engineering (Florianópolis, Br): 'Detection and analysis of Nanoparticles in complex matrices', 10.2014 (6h)
- COST Short course (Santiago di Compostela, Spain): 'Detection of engineered Nanoparticles in complex matrices', 11.2014 (4h)

Selected invited contributions:

- Mikroplastik im Abwasser: Ein Problem für die Umwelt? 26.10.2023, Engelberger Dialoge, Kursaal Engelberg.
- Potential of Electron Microscopy for Micro – Nanoplastic analysis, Euroanalysis, 27. – 31.08.2023, Geneva, Switzerland (invited talk).
- Der Schweizer Blick auf die Mikroplastik-Problematik, Mikroplastik im Abwasser – Einordnung und Handlungsempfehlungen, 20.10.2022, DWA, Hannover, D
- Microplastic analysis in complex matrices, INFRAMES 2022, Kickoff, 25. – 27.05.2022, Duke University, Durham, NC, USA
- Identification of (Engineered) Nanomaterials and the Relevance of Their (Chemical) Transformation in Urban Waste Management Systems, June 2 – 7, 2019, Newry, ME, USA. Invited talk

- Quantification of (Engineered) Nanoparticles in Complex Matrices: More than a Silver Lining on the Horizon? 4th IMEKOFODS – Metrology supporting emerging food topics. September 16th – 18th 2019, Brussels, Belgium, keynote lecture
- The Quest of Engineered and Transformed Nanoparticles: Challenges, Limitations and Wishful Thinking. International Conference on the Environmental Effects of Nanoparticles and Nanomaterials. September 1st – 4th 2019, Vienna, Austria, keynote lecture.
- Fate of Nanoparticles in Managed Waste Facilities, 3rd EU-Asia Dialogue on Nanosafety: Occupational Exposures to Manufactured Nanomaterials (MN) and Waste Disposal, March 18th 2019, Bangkok, Thailand, keynote lecture
- Fate of Nanoparticles in Managed Waste Facilities - Perspectives from research - the NanoFASE project, Nanotechnology Industries Associations (NIA) 8th Annual Symposium, March 27th 2019, Brussels, Belgium
- Nanoparticles in Sewage Sludge: Natural, Incidental or Engineered? Goldschmidt conference, Boston, 12.-17.08.2018, invited
- Challenges of Environmental Nanotechnology, SNO conference, Tribute to Pedro Alvarez, 5.-7.11.2017, Los Angeles, USA, invited
- Engineered nanoparticles in complex matrices: Challenges and opportunities for electron microscopy. 5th FFF-MS workshop, 28.-29.09.2017, Vienna, Austria, invited
- Analytical Challenges and Possible Strategies to Quantify Engineered Nanoparticles in Managed Waste Facilities, Swiss NanoConvention, 01-02.06.2017, Fribourg, Switzerland, invited.
- Fate of engineered nanomaterials in urban (water) systems, Technical Seminar on: Engineered Nanoparticles (ENPs) in the environment: Fate and Risk. 06.02.2017, Braga, Portugal.
- Environmental Nano Testing Media Harmonization (2016), A Workshop Convened by the Center for the Environmental Implications of Nanotechnology (CEINT), 29.02.-02.03.2016, Duke University, NC, USA, invited
- Applications of silver nanoparticles in water and wastewater: Challenges and limitations due to transformations (2016), IWA Nano & Water Specialist Conference at Rice University, USA
- Silver Nanoparticles in managed waste facilities: From metallic to sulfidic and back again (2016) Nanometrology France: Symposium on Detection, location & quantification of nanomaterials and by-product released from nano-enable products, Paris
- Silver Nanoparticles in the urban environment: From the emission to the incineration (2015) University of Innsbruck, Research Institute for Limnology
- Separation and analysis of engineered nanoparticles (ENP) in aqueous environmental samples (2015), WetPol Preconference Workshop, York, UK
- Transformations silver nanoparticles in urban wastewater systems, InterNano Conference (2014), Landau, D
- Transformation of Ag-NP in urban waste- and surface waters, Goldschmidt Conference, (2014), Sacramento, USA
- Nanomaterials in the aquatic environment (2014), BNASS – Transspec conference, 31.08 – 04.09., Aberdeen, UK
- Detection and Quantification of Engineered Nanoparticles in Environmental Matrices, Wasserchemisches und -technologisches Kolloquium, 01.10.2014, Karlsruhe, D
- Silver nanoparticles in urban wastewater systems: More nano, more problems? (2013), IWA Symposium on Environmental Nanotechnology, April 24-27, 2013 Nanjing, China
- Detection and Quantification of Engineered Nanoparticles in Complex Matrices (2013), CHanalysis, Swiss Chemical Society (29. – 30. 11.2013, Beatenberg, CH
- Silver Nanoparticles: Blessing o Curse (2012), Analytica, 17.04.2012,, Munich, D
- Detecting and characterizing silver nanoparticles in urban wastewater systems (2012), JRC-Nanobiotechnology meeting , 4 – 6.12. 2012, Ispra, It
- Fate and Behavior of Silver Nanoparticles in Urban Wastewater Systems (2012), IWA Particle Separation Conference, 18. – 20. June 2012, Berlin, D (keynote lecture)
- Silver Nanoparticles in the Wastewater – Wicked or Tame? (2011) Health and Environment - Frontiers in Environmental Health, Challenges for Water Safety, 28.10 2011, Luxembourg, (keynote lecture)

Reviewing activities:

- Nature Water, Environmental Science and Technology, Aquatic Sciences, Geochimica et Cosmochimica Acta, Current Nanoscience, Water Resources Research, Chemosphere, Journal of Environmental Management, Geophysical Research Letters, Environmental Pollution, Journal of Microscopy, ACS Nano, Environmental Nano, Deutsche Forschungsgemeinschaft (DFG)
- Guest Editor, Water Research Special Issue on 'Nanotechnology in the Water Sector', 2012
- Guest Editor, Chem. Eng. and Processing: Process Intensification, SI: COBEQ 2014.
- Member of the Advisory Board of Environmental Science Nano (since 10.2016)