

Curriculum Vitae

PERSONAL INFORMATION

Family name, First names: Haase, Martin Frodo

Researcher unique identifier: orcid.org/0000-0002-1355-151X

Nationality: German

URL for web sites:

<http://www.martinhaase.com>

<https://scholar.google.com/citations?user=JZDzKMMAAAAJ&hl=en>

• SUMMARY OF SCIENTIFIC ACHIEVEMENTS

My most significant scientific achievement was the discovery of Solvent Transfer Induced Phase Separation (STriPS) to generate bicontinuous interfacially jammed emulsion gels (bijels) and high order multiple emulsions. STriPS drastically simplifies bijel formation, which was previously only investigated by 2 research groups worldwide. Since the initial publication in 2015, the STriPS method has been reproduced in 13 scientific publications from research groups around the globe and my publications related to STriPS have been cited over 155 times.

Based on STriPS, I introduced bijels as templates for ultrafiltration membranes and as catalytic microreactors. My discovery at the University of Pennsylvania (UPenn) and New York University (NYU) was awarded 2 international patents and 4 first author publications in leading and multidisciplinary scientific journals.

My discovery of forming bijels by STriPS originated from combining the results obtained during my postdoc at New York University (NYU) and my PhD studies at the Max Planck Institute of Colloids and Interfaces (MPI): At NYU, I pioneered ternary liquid phase separation for the formation of complex emulsions. At the MPI, I innovated nanoparticle surface modifications for emulsion stabilization and nanoencapsulation systems for applications in self-healing coatings.

My research work has also diversified beyond STriPS as shown by my work on lipid monolayer phase equilibria at the interface between two immiscible liquids, my studies of polyelectrolyte complexation for microencapsulation, and my recent collaborative work on liquid crystal mediated self-assembly of nanoparticles.

During all stages of my career I have been engaged as a teacher and outreach facilitator based on my aim to increase participation of underrepresented groups in natural sciences and engineering. I worked as a science outreach volunteer in high and middle schools in Germany and the United States, as a seminar speaker for advanced training of high school teachers, and as a high school student summer internship supervisor. My research and teaching are continuously exposed to a broad audience via my educational YouTube channel, which currently has more than 45.600 views worldwide with a total of 82.400 watched minutes.

• EDUCATION

2008 – 2011 PhD in Physical Chemistry, PhD thesis defended on October 25th, 2011
Max Planck Institute of Colloids and Interfaces, Potsdam, Germany
PhD supervisor: [Prof. Dr. Dr. h.c. Helmuth Möhwald](#),

2004 – 2008 Dipl. Ing. (FH) in Process Engineering, Beuth University, Berlin, Germany

• CURRENT POSITION

2019 – now Assistant Professor UD-1 level (tenure track)
Utrecht University, Department of Chemistry, Van't Hoff Laboratory of Physical and Colloid Chemistry, Debye Institute of Nanomaterials Science, Supervisor: [Prof. Willem Kegel](#)

• PREVIOUS POSITIONS

- 2016 – 2019 Assistant Professor (tenure track position)
Department of Chemical Engineering, Rowan University, Glassboro NJ, USA
- 2014 – 2016 DFG-postdoctoral fellow
Department of Chemical and Biomolecular Engineering, University of Pennsylvania, USA
[Prof. Kathleen Stebe](#), [Prof. Daeyeon Lee](#)
- 2012 – 2014 Postdoctoral scholar
Department of Physics, Center of Soft Matter Research, New York University, USA

• AWARDS

- 2019 – 2024 **ERC-Starting Grant**, Panel 8 “Products and Process Engineering”, 3D Flow Analysis in Bijels Reconfigured for Interfacial Catalysis (3D-FABRIC), €1.9 Mio.
- 2019 – 2020 **ACS-PRF award**, American Chemical Society, PRF# 59709-DNI5, \$110,000.
- 2018 – 2023 **NSF-CAREER award**, CBET division, program “Particulate and Multiphase processes”, \$500,000.
- 2018 – 2019 **Rowan University Seed Fund**, University internal competitive proposal, \$10,000.
- 2015 University of Pennsylvania Nano Day, Animation award, [link](#)
- 2015 5th International Colloids Conference, Best poster prize, Amsterdam, Netherlands
- 2014 – 2016 **DFG-Postdoctoral fellowship**, 16 months, 43.000 Euros

• SUPERVISION OF GRADUATE STUDENTS

- 2016 – now Supervision of 4 PhD students, 1 MS student, Department of Chemical Engineering, Rowan University, USA

• TEACHING ACTIVITIES

- 2017 – 2018 Undergraduate course: Process Fluid Transport, Rowan University, USA
- 2017 – 2019 Undergraduate course: Principles of Chemical Processes II, Rowan University, USA
- 2017 – 2019 Project assignment and research supervision for 18 undergraduate students in my laboratory
- 2015 Summer program seminar speaker for high school students, [Marylin Huff](#), University of Pennsylvania
- 2014 – 2017 Personal Youtube.com channel: 23 self-made teaching videos about colloid and interface science with more than 40,700 views and 74,200 watched minutes, [link](#)
- 2014 Supervision and project assignment for a 4-month internship of a high school student, New York University
- 2013 – 2014 Mini course lecturer (3 seminars) for high school teachers, Math for America, [Noah Heller](#), New York, [link](#)
- 2012 – 2014 Teaching volunteer for K-12 students, [Dr. Ben Dubin Thaler](#), Biobus.org, New York, [link](#)
- 2009 Teaching assistant Physical Chemistry, [Prof. Bechmann](#), University of Potsdam, Germany
- 2007 – 2008 Teaching assistant Thermodynamics, Engineering Mechanics, 4 semesters, [Prof. Seifert](#), [Prof. Kleinschrodt](#), Beuth University Berlin, Germany

• INSTITUTIONAL RESPONSIBILITIES

- 2017 – 2019 Chair of the Chemical Engineering (ChE) Seminar series at Rowan University. Organization of schedules and seminar for notable visitors: Prof. Ali Khademhosseini (UCLA), Prof. Daeyeon Lee (UPenn), Prof. Amy Peterson (UMass Lowell), Prof. Urmila Diwekar (UIC), Prof. Stephano Sacanna (NYU), Prof. Mike Jaffe (NJIT).
- 2017 – 2019 Organizer of the ChE graduate student research seminar at Rowan University. Organization of weekly presentations by graduate students to the department.
- 2017 – 2019 Faculty member, Department of Chemical Engineering, Rowan University, USA

• SERVICE TO THE PROFESSIONAL SOCIETY

- 2019 National Science Foundation (NSF) Reviewer and Panelist, Program: Particulate and Multiphase Processes, Panel: FY19 UNS Interfacial transport panel (PMP Panel 1)

- **JOURNAL PEER REVIEWING**

Nature Nanotechnology, ACS Nano, Nature Communications, Angewandte Chemie Int. Ed., Langmuir, ACS Applied Materials & Interfaces, Journal of Materials Science, Soft Matter, Journal of Chemical Engineering, Current Opinion in Colloid and Interface Science

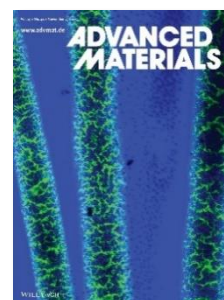
- **INDUSTRY INTERNSHIPS**

- 2007 Lurgi GmbH (Air Liquid), Frankfurt/Main, Germany, Harald Koempel, 3 months, Basic engineering for a large scale “Methanol to Propylene” Plant, [link](#)
- 2006 Uhde Inventa Fischer (ThyssenKrupp), Berlin, Germany, Udo Mühlbauer, 2 months, Basic engineering large scale polyester plant and operation of a polylactide pilot plant, [link](#)
- 2005 Silica Verfahrenstechnik, Berlin, Germany, 2 months, Construction of gas adsorption plants, [link](#)
- 2004 HME-Regelungstechnik, Bad Kreuznach, Germany, 2 months, Fine metal processing
- 2002 Umweltamt (Environmental agency), Department of water surveillance, Frankfurt/Main, Germany, 2 months, sample drawing, analytical contaminant determination

- **PUBLICATIONS**

Key publications

- 2017 M.F. Haase, H. Jeon, N. Hough, K.J. Hak, K.J. Stebe, D. Lee, *Bijel-derived Multifunctional Nanocomposite Hollow Fiber Membranes*, **Nature Communications**, 1234 (2017), [link to article](#)
- 2016 M.F. Haase, N.S. Mood, K.J. Stebe, D. Lee, *In Situ Mechanical Testing of Nanostructured Bijel Fibers*, **ACS Nano**, 10, 6, 6338, [link to article](#)
- 2015 M.F. Haase, K.J. Stebe, D. Lee, *Continuous Fabrication of Hierarchical and Asymmetric Bijel Microparticles, Fibers and Membranes by Solvent Transfer-induced Phase Separation (STRIPS)*, **Advanced Materials (front cover illustration)**, 27, 44, 7065, [link to article](#)
- Article was highlighted in six press releases:**
Penn News, Phys.org, Technology.org, Science Daily, Azo Materials, Newswise.com
- 2014 M.F. Haase, J. Brujic, *Tailoring of High-Order Multiple Emulsions by the Liquid–Liquid Phase Separation of Ternary Mixtures*, **Angewandte Chemie International Edition**, 126, 44, 11987, [link to article](#)
Article was highlighted in the Journal **Science**, [link to highlight](#)
- 2012 M.F. Haase, D. Grigoriev, H. Moehwald, D.G. Shchukin, *Development of Nanoparticle Stabilized Polymer Nanocontainers with High Content of the Encapsulated Active Agent and Their Application in Water Borne Anti Corrosive Coatings*, **Advanced Materials**, 24, 18, 2429-2435, [link to article](#)



Other Peer Reviewed Journal Publications

- 2019 Sanghak Cha, Hyun Gyu Lim, M.F. Haase, Kathleen J. Stebe, Gyoo Yeol Jung, Daeyeon Lee, *Enhancing Enzymatic Conversion of a Highly Water Insoluble Substrate Using Bicontinuous Interfacially Jammed Emulsion Gels (Bijels)*, **Scientific Reports**, [link to article](#)
- 2019 S. Boakye-Ansah, M. Schwenger, and M.F. Haase, *Designing Bijels formed by Solvent Transfer Induced Phase Separation with Functional Nanoparticles*, **Soft Matter**, 15(16), 3379-3388, [link to article](#)
- 2019 L. Tran, M.F. Haase, *Templating interfacial nanoparticle assemblies via in-situ techniques*, **Langmuir**, 35 (26), 8584-8602, [link to article](#)
- 2018 G. Di Vitantonio, T. Wang, M.F. Haase, K. J. Stebe, D. Lee, *Robust Bijels for Reactive Separation via Silica-Reinforced Nanoparticle Layers*, **ACS Nano**, 13, 1, [link to article](#)

- 2018 L. Tran, H.-N. Kim, N. Li, S. Yang, K.J. Stebe, R.D. Kamien, and M.F. Haase, *Shaping nanoparticle fingerprints at the interface of cholesteric droplets*, **Science Advances**, 4, Impact factor (2017): 11.5, [link to article](#)
- 2017 G. Duan, M.F. Haase, K. Stebe, D. Lee, *One-Step Generation Salt-Responsive Polyelectrolyte Microcapsules via Surfactant Organized Interfacial Complexation in Emulsions*, **Langmuir**, DOI: [10.1021/acs.langmuir.7b01526](#)
- 2017 L. Tran, M.O. Lavrentovich, G. Durey, A. Darmon, M.F. Haase, D. Lee, K.J. Stebe, R.D. Kamien, T.L.-Leon, *A change in stripes for cholesteric shells via anchoring in moderation*, **PRX**, [7, 041029](#)
- 2013 L.L. Pontani, M.F. Haase, I. Raczkowska, J. Brujic, *Immiscible lipids control the morphology of patchy emulsions*, **Soft Matter**, [9, 7150-7157](#)
- 2012 D.O. Grigoriev, M.F. Haase, N. Fandrich, A. Latnikova, D.G. Shchukin, *Emulsion Route in Fabrication of Micro- and Nanocontainers for Biomimetic Self Healing and Self Protecting Functional Coatings*, **Bioinspired, Biomimetic and Nanobiomaterials**, [1, 101-116](#)
- 2012 O. Zech, M.F. Haase, T. Zemb, H. Moehwald, *Froth Flotation via Microparticle Stabilized Foams*, **Colloid Surface A**, [413, 2-6](#)
- 2011 M.F. Haase, D. Grigoriev, H. Moehwald, B. Tiersch, D.G. Shchukin, *Nanoparticle Modification by Weak Polyelectrolytes for pH Responsive Pickering Emulsions*, **Langmuir**, [27\(1\), 74-82](#)
- 2010 M.F. Haase, D. Grigoriev, H. Moehwald, B. Tiersch, D.G. Shchukin, *Encapsulation of Amphoteric Substances in a pH Responsive Pickering Emulsion*, **Journal of Physical Chemistry C**, [114, 17304-17310](#)

- **INVITED BOOK CHAPTER**

- 2019 M.F. Haase, *Solvent Transfer Induced Phase Separation for Bicontinuous Pickering Emulsions*, Book Chapter in *Bijels: Bicontinuous particle-stabilized emulsions*, edited by Paul Clegg. **Royal Society of Chemistry**.

- **PATENTS**

- 2016 D. Lee, J. Doh, M. Kim, M.F. Haase, G. Duan *Polyelectrolyte microcapsules and methods of making the same*, Filed 2016, US Provisional Patent: US 15/097,874
- 2016 M.F. Haase, K.J. Stebe, D. Lee, *Bijels and methods of making the same*, Filed 2015, US Provisional Patent: 62/169,295, nonprovisional patent filing in April 2016
- 2015 J. Brujic, M. F. Haase, *Higher Order Multiple Emulsions* - US Patent 20,160,051,954

- **INVITED PRESENTATIONS**

- 2019 *New Directions for STRIPS bijels: Bijel fiber helices and inverted STRIPS bijels*, Session: Multiphase Fluids for Materials Science: Droplets, Bubbles and Emulsions, **MRS Fall Meeting**, Boston, USA
- 2019 *Tailoring bicontinuous materials by phase separation and interfacial assembly*. **Debye Institute 30th Anniversary Symposium**, Utrecht University, The Netherlands
- 2019 *Tailoring bicontinuous materials by phase separation and interfacial assembly*, **27th Dutch Soft Matter Meeting**, Utrecht, The Netherlands
- 2018 3D-Flow Analysis in Bijels reconfigured for Interfacial Catalysis (3D-FABRIC), **Debye Colloquium**, Utrecht University, The Netherlands
- 2018 Plenary speaker, *Continuous Fabrication of Hierarchical and Asymmetric Bijel Microparticles, Fibers, and Membranes by Solvent Transfer-Induced Phase Separation (STRIPS)*, International Association of Colloid and Interface Scientists (**IACIS**), Rotterdam,
- 2017 *Multifunctional Nanocomposite Membranes Based on Bijels*, Session: Multiphase Fluids for Materials Science: Droplets, Bubbles and Emulsions, **MRS Fall Meeting**, Boston, USA
- 2015 **University of Edinburgh**, Invited by Prof. Paul Clegg, Scotland

- **ORAL PRESENTATIONS AT MAJOR CONFERENCES**

- 2019 M.F. Haase, *Advective flow in bijels* (Keynote presentation), **ECIS Leuven**, Belgium
- 2018 M.F. Haase, *Shaping Nanoparticle Fingerprints at the Interface of Cholesteric Liquid Crystal Droplets*, **AICHE Meeting**
- 2016 M.F. Haase, K. Stebe, D. Lee, *In Situ Mechanical Testing of Bijel Fibers*, **AICHE Annual Meeting**, San Francisco, USA
- 2016 M.F. Haase, K. Stebe, D. Lee, *Bijel derived, fouling resistant and catalytic ultra-/micro- filtration membranes for advanced water treatment applications*, **AICHE Annual Meeting**, San Francisco
- 2015 M.F. Haase, K. Stebe, D. Lee, *Tailoring of Bijel fibers and membranes by mass transfer-induced liquid-liquid phase separation of ternary mixtures*, **ECIS Conference**, Bordeaux, France, [link](#)
- 2015 M.F. Haase, K. Stebe, D. Lee, *Tailoring of Bijel fibers and membranes by mass transfer-induced liquid-liquid phase separation of ternary mixtures*, **5th International Colloids Conference**, Amsterdam, Netherlands
- 2015 M.F. Haase, K. Stebe, D. Lee, *Tailoring of Bijel fibers and membranes by mass transfer-induced liquid-liquid phase separation of ternary mixtures*, **ACS Colloids Conference**, Pittsburgh, USA
- 2014 M.F. Haase, J Brujic, *General principles of ternary phase separation into multilayered emulsions facilitate wide applications*, **ACS Colloid and Surface Science Symposium**, Philadelphia, USA
- 2014 M.F. Haase, J Brujic, *Ternary liquid mixtures control the multiplicity, shape and internal structure of emulsion droplets*, **APS March Meeting**, Denver, USA
- 2014 L.L. Pontani, D Bargteil, M.F. Haase, J Brujic, *Liquid domains of lipid monolayers on the surface of oil-in-water emulsions*, **APS March Meeting**, Denver, USA (presenting author)
- 2011 M.F. Haase, *Encapsulation of Active Molecules for Anti-Corrosive Coatings*, **ECIS**, Berlin