

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>

https://academics.rowan.edu/engineering/programs/chemical/people/faculty_pages/Haase-Martin.html

• SUMMARY OF SCIENTIFIC ACHIEVEMENTS

My most significant scientific achievement was the discovery of Solvent Transfer Induced Phase Separation (STriPS) to generate hierarchically structured bicontinuous interfacially jammed emulsions (bijels). STriPS drastically simplifies bijel formation, which was previously only investigated by 2 research groups worldwide. With STriPS, the strong application potentials of bijels in catalysis and separation membranes, battery materials and tissue engineering scaffolds become tangible. My discovery at the University of Pennsylvania (UPenn) was awarded an international patent and 3 first author publications in leading and multidisciplinary scientific journals (*Advanced Materials*, *ACS Nano*, *Nature Communications*). My work at UPenn was also self-funded based on my successful proposal for a research fellowship from the German Research Foundation (DFG). After the completion of my research fellowship I accepted a tenure track position as Assistant Professor at Rowan University, USA. In my second year as assistant professor, I won the NSF-CAREER award based on my first submission for the competition. Moreover, the European Research Council awarded the ERC-Starting grant to me.

My discovery of nanoparticle arrested bicontinuous emulsions would not have been possible without my prior work as a postdoc at New York University (NYU) and as a PhD student at the Max Planck Institute of Colloids and Interfaces (MPI):

At NYU, I pioneered ternary liquid phase separation for the formation of complex emulsions. This work received a US patent and two publications, one as first author in the leading chemistry journal *Angewandte Chemie International Edition*.

At the MPI, I innovated nanoparticle surface modifications for emulsion stabilization and nanoencapsulation systems. This work has led me to invent a self-healing polymeric coating with corrosion inhibitor filled nanocontainers. My PhD work concluded with a first author publication in the leading journal *Advanced Materials*, 2 additional first author papers (*Langmuir* and *JCCP*) and 2 more second author papers.

As assistant Professor of Chemical Engineering, I am now heading a laboratory with five graduate students at Rowan University. I am also the organizer of the Department research seminar, with several notable invited speakers.

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 is continuously exposed to a broad audience via my educational YouTube channel, which currently has more than 24.000 views worldwide with a total of 48.000 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

2016 – now Assistant Professor (tenure track position)
Department of Chemical Engineering, Rowan University, Glassboro NJ, USA

- **PREVIOUS POSITIONS**

- 2014 – 2016 DFG-postdoctoral fellow
Department of Chemical 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 – now Undergraduate course: Fluid dynamics II, Rowan University, USA
- 2017 – now Undergraduate course: Principles of Chemical Processes II, Rowan University, USA
- 2017 – now 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 – now 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 – now Organizer of the ChE graduate student research seminar at Rowan University. Organization of weekly presentations by graduate students to the department.
- 2017 – now 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

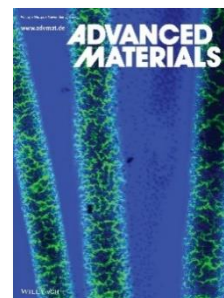
- **INDUSTRY INTERNSHIPS**

- 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 without PhD supervisor

- 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 article](#)



Key publication with PhD supervisor (Prof. Dr. Dr. h.c. Helmuth Möhwald)

- 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 L. Tran, M.F. Haase, *Templating interfacial nanoparticle assemblies via in-situ techniques*, **Langmuir**, accepted
- 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](https://doi.org/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](https://doi.org/10.1103/PRX.7.041029)
- 2013 L.L. Pontani, M.F. Haase, I. Raczowska, J. Brujic, *Immiscible lipids control the morphology of patchy emulsions*, **Soft Matter**, **9**, [7150-7157](https://doi.org/10.1039/c3sm26383a)
- 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](https://doi.org/10.1002/bim.1116)
- 2012 O. Zech, M.F. Haase, T. Zemb, H. Moehwald, *Froth Flotation via Microparticle Stabilized Foams*, **Colloid Surface A**, **413**, [2-6](https://doi.org/10.1016/j.colsurfa.2012.02.006)
- 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](https://doi.org/10.1021/lm10123a011)
- 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](https://doi.org/10.1021/jp9117310)

- **SUBMITTED MANUSCRIPTS**

- 2019 S. Boakye-Ansah, M. Schwenger, and M.F. Haase, *Designing Bijels formed by Solvent Transfer Induced Phase Separation with Functional Nanoparticles*
- 2018 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)*

- **INVITED REVIEW ARTICLES AND BOOK CHAPTERS IN PREPARATION**

- 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
- 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**

- 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