

Dr. Sebastian Z. Oener

Nationality: **German**, Languages: **German, English**

Researcher unique identifier (ORCID): **0000-0003-0770-4089**

Google Scholar: <https://scholar.google.nl/citations?user=p4gaA1oAAAAJ&hl=nl>

Website: <https://www.fhi.mpg.de/isc-dept/research-groups/interfacial-ionics>

CURRENT POSITION

- 2022 – **Group Leader**, Interface Science Department,
Fritz Haber Institute of the Max Planck Society, Berlin, Germany

POSTDOCTORAL POSITIONS and EDUCATION

- 2020 – 2021 **Fritz Haber Institute**, Interface Science Department, Berlin, Germany
Postdoc Supervisor: Prof. Dr. Beatriz Roldán Cuenya
- 2017 – 2020 **University of Oregon**, Department of Chemistry and Biochemistry, Eugene, USA
Postdoc Supervisor: Prof. Dr. Shannon Boettcher (now UC Berkeley)
- 2012 – 2016 **FOM Institute AMOLF**, Amsterdam, The Netherlands
PhD in Nanophotonics, University of Amsterdam, Netherlands
Supervisor: Prof. Dr. Erik Garnett, Promotor: Prof. Dr. Albert Polman
- 2009 **Massachusetts Institute of Technology**, Cambridge, USA
Supervisor: Prof. Dr. Tonio Buonassisi, Mechanical Engineering
- 2006 – 2012 **University of Konstanz**, Department of Physics, Konstanz, Germany
Diploma in Physics, Diploma Thesis Supervisor: Prof. Dr. Giso Hahn

RESEARCH EXPERTISE

electrochemistry, interfacial ion solvation, bipolar membranes, electrocatalysis, scanning electrochemical microscopy, nanophotonics,

FELLOWSHIPS AND AWARDS

- 2023 – 2027 **ERC Starting Grant ORION**, Fritz Haber Institute, Berlin, Germany
- 2018 – 2020 **DFG Postdoctoral Fellowship**, University of Oregon, USA

INDEPENDENT FUNDING (total ~2.8m€)

- 2023 – 2027 **ERC Starting Grant ORION (1.75m€)**:
Operando Interfacial Ionics
- 2023 – 2026 **ANR-DFG Apricot** (my co-PI share as FHI Lead: **240k€**):
Advanced Bipolar Membranes for Energy and Electrodialysis Technology
- 2023 – 2026 **BMBF Reveal** (my co-PI share as FHI Lead: **840k€**):
Reversible Bipolar Membrane Fuel Cells

SUPERVISION AS GROUP LEADER

- 2022 – **4 PhDs, 7 Postdocs**, (+ 6 guest PhDs and Postdocs), **4 high school students**

TEACHING EXPERTISE

- Fall 2024: **Electrochemistry 2.0, 5 ECTS**
MSc level, 28 (45min) classes, 15 students, Department of Chemistry, Free University of Berlin

PHD COMMITTEE MEMBER

- **DTU** (Technical University of Denmark, October 2024): **Yi-Lin Kao**
Supervisor: Lars David Aili, Brian Seeger
- **ENS** (Ecole Normale Supérieure, June 2024): **Mathieu Lizée**
Supervisor: Lydéric Bocquet

Five MOST SIGNIFICANT PUBLICATIONS (as of 30.12.2024, full list on Google Scholar):

As Principal Investigator:

1. **Entropy-Enthalpy Relationships of the Hydrogen Evolution Reaction**
J.M. Gisbert-Gonzalez, C.G. Rodellar, J. Druce, E. Ortega, B. Roldan Cuenya, S.Z. Oener,*
in review (2024)
2. **Exploring Dynamic Solvation Kinetics at Electrocatalyst Surfaces**,
F. Sarabia, C.G. Rodellar, B. Roldan Cuenya, S.Z. Oener,*
Nature Communications (2024), <https://www.nature.com/articles/s41467-024-52499-9>
3. **Ion Solvation Kinetics in Bipolar Membranes and at Electrolyte-Metal Interfaces**,
C.G. Rodellar, J.M. Gisbert-Gonzalez, F. Sarabia, B. Roldan Cuenya, S.Z. Oener,*
Nature Energy (2024) <https://www.nature.com/articles/s41560-024-01484-z>
Highlighted in:
 - **Understanding entropic barriers**, A. Zeradjanin, **Nature Energy**
<https://www.nature.com/articles/s41560-024-01502-0>

As Postdoc:

4. **Accelerating Water Dissociation in Bipolar Membranes and Electrocatalysis**,
S.Z. Oener,* M. Foster, S.W. Boettcher,*
Science 369, 6507, 1099-1103 (2020), *co-corresponding author
5. **Thin-Cation Exchange Layers Enable High-Current-Density Bipolar Membrane Electrolyzers via Improved Water Transport**,
S.Z. Oener,* L.P. Twight, G.A. Lindquist, S.W. Boettcher,*
ACS Energy Letters 6, 1, 1-8 (2021), *co-corresponding author

PATENTS

Lead Inventor:

- **Bipolar Membrane Catalysis,**
S.Z. Oener (50%), M. Foster (5%), S.W. Boettcher (45%)
US Patent 11,268,200 (2022)

REVIEWING ACTIVITIES

- 2019 – **Journals:** ACS Catalysis, ACS Energy Letters, ACS Electrochemistry, ACS Chemical Reviews, Nature Chemistry, Nature Catalysis, Nature Energy, Nature Synthesis, Nature Comm., Journal of Electrochemical Society, Joule, Energy & Environmental Science ...
- 2023 – **Funding Agencies:** European Research Council (Starting Grants)

TALKS

- Invited talks:
 - Technical University of Denmark, Dep. of Energy Conversion and Storage, Denmark, 2024
 - TNO, The Netherlands, Online, 2024
 - Deutscher Künstlerbund, Berlin, Germany, 2023
 - Helmholtz Institute Berlin, Berlin, Germany, 2019
 - Fritz-Haber-Institute, Berlin, Germany, 2019
 - Department of Chemical Engineering, TU Delft, Netherlands, 2019
 - Leiden Institute of Chemistry, Leiden University, Netherlands, 2019
 - CNRS CINaM, Marseille, France, 2019
 - Pacific Coast Catalysis Society Meeting, Corvallis, USA, 2018
- Contributed talks:
 - Electrochemistry 2024, Braunschweig, Germany
 - Electrochemistry GRC 2024, Ventura, CA, USA
 - Electrochemistry GRS 2020, Ventura, CA, USA
 - Electrolysis and Fuel Cell Discussions 2019, La Grande Motte, France
 - University of Oregon and Oregon State Diversity Workshop and Symposium 2019, USA
 - ACS Spring Meeting 2017, San Francisco, USA
 - Physics@Veldhoven 2016, Veldhoven, Netherlands
 - Fall MRS Meeting 2015, Boston, USA
 - Spring MRS Meeting 2014, San Francisco, USA