

# Dionigi, Fabio

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**Summary:** Experimental evaluation of catalytic activity, selectivity and stability in electrochemical cells and material characterization using in situ, ex situ and operando methods (RDE, EIS, XRD, operando XAS, operando WAXS, Rietveld refinement, PDF analysis, XRF, UV-vis-IR, ICP-OES, QMS); Research project management in energy storage and energy conversion technologies; Up-scaling performance test development from lab-level to larger prototypes.

## • CURRENT POSITION

01/2023 – now

**Scientist permanent position** (Prof. Peter Strasser group)

Department of Chemistry, Chemical Engineering Division, Technische Universität Berlin, DE.

- Project leader within “(ANion Exchange Membrane Electrolysis from Low-grade water sources)” (ANEMEL).
- Managing the laboratory activity of three students.
- Corresponding author of publications in international leading journals.

## • PREVIOUS POSITIONS

05/2016 – 10/2022

**Project leader (Postdoc)** (Prof. Peter Strasser group)

Department of Chemistry, Chemical Engineering Division, Technische Universität Berlin, DE.

- Project leader within “Next Generation Automotive Membrane Electrode Assemblies” (GAIA project, <https://www.gaia-fuelcell.eu/>), and “Integration of Novel Stack Components for Performance, Improved Durability and Lower Cost” (INSPIRE project, <https://www.inspire-fuelcell.eu/>) (completed).
- Managing the laboratory activity of four students.
- Supervision of five master theses and two bachelor theses.
- Teaching assistant of students in laboratory exercises.
- Corresponding author of publications in international leading journals.
- Invited talks in several international conferences.
- Writing of EU and DFG funded projects.
- Writing of proposals for advanced electrochemical operando X-ray scattering and absorption spectroscopy measurements at synchrotron facilities, participating to the beamtimes as leading scientist and leading the data analysis.

11/2013 – 04/2016

**Postdoc position** (Prof. Peter Strasser group)

Department of Chemical Engineering, Technische Universität Berlin, DE.

- Development of benchmarking protocols and electrochemical testing of catalytic activity, selectivity and stability of new catalyst materials for electrolyzers and seawater electrolysis.
- Shape-control nanoparticle synthesis by solvothermal methods.
- Rotating disk electrode (RDE).

04/2013 – 10/2013

**Postdoc position** (Prof. Ole Hansen group)

DTU Nanotech, Department of Micro- and Nanotechnology, DTU, Dk.

- Postdoc project: "High Efficiency Integrated Solar Energy Converter"
- Responsible of UHV chamber equipped with XPS.

10/2012 – 12/2012      **Scientific assistant** (Prof. Ib Chorkendorff group)  
Department of Physics, Danmarks Tekniske Universitet, Denmark.

• **EDUCATION**

11/2009 – 10/2012  
(awarded 03/2013)      **PhD:** “Gas phase photocatalytic water splitting in silicon based  $\mu$ -reactors”  
Department of Physics, Danmarks Tekniske Universitet, Denmark.  
Prof. Ib Chorkendorff group.

10/2006 – 03/2009      **Master degree** in Physics of Condensed Matter: “Two-dimensional electron  
gas in quantum Hall regime” (Prof. Vittorio Bellani group).  
Department of Physics, Università degli studi Pavia, Italy.

• **EXTERNAL STAGES**

11/2016 – 11/2016      Johnson Matthey Fuel Cells (Sonning Common, UK). One week.  
- Training for the floating electrode (FE) technique.

04/2014 – 04/2014      Prof. Patrik Schmuki's group, Friedrich-Alexander-Universität Erlangen-  
Nürnberg (Germany). One week.

10/2011 – 11/2011      Domen-Kubota Lab, The University of Tokyo (Japan). One month.

• **FELLOWSHIPS, SCHOLARSHIPS AND AWARDS**

02/2008 – 06/2008      **Erasmus scholarship** at Technical University of Denmark, (Dk).

05/2009 – 10/2009      **Research Grant** “Analysis of new materials for opto-electronic and  
photovoltaic applications” (Prof. Vittorio Bellani group)  
Department of Physics, Università degli studi Pavia, Italy.

• **SUPERVISION OF GRADUATE STUDENTS**

03/2014 – now      Five master theses and two bachelor theses in the Department of Chemical  
Engineering, Technische Universität Berlin, Germany.

• **TEACHING ACTIVITIES**

01/2010 – 05/2012      Teaching assistant of students in laboratory exercises during the course of  
Experimental Surface Physics held by prof. Ib Chorkendorff. Department of  
Physics, Danmarks Tekniske Universitet, Denmark. (4 days/year).

01/2015 – now      Teaching in laboratory exercises for five Forschungspraktika students at  
Department of Chemical Engineering, Technische Universität Berlin,  
Germany. (2 weeks/each).

• **WRITING CONTRIBUTION TO SCIENTIFIC PROPOSALS**

- **INSPIRE:** Integration of Novel Stack Components for Performance, Improved Durability and Lower Cost, FCH 2 JU 2016-2019.
- **GAIA:** next Generation Automotive membrane electrode Assemblies, FCH 2 JU, 2019-2021.
- **PAK 981:** Elucidating the role of catalyst-support interaction on the activity and stability of water splitting catalysts, DFG (STR 596/12-1), 2019-2022.
- **ANEMEL:** ANion Exchange Membrane Electrolysis from Low-grade water sources, HORIZON-EIC-2021-PATHFINDERCHALLENGES-01-04, 2022-2026.

- **HIGHLANDER**: “HIGH performing uLtrA-durable membraNe electroDe assEmblies for tRucks”, HORIZON-JTI-CLEANH2-2022-1.

- **EXPERIENCE AT SYNCHROTRON FACILITIES**

Five beamtime proposals accepted as Main Proposer: ESRF ID31 May 2016, BESSY II mySpot June 2016, BESSY II mySpot October 2016, ESRF ID31 May 2017, BESSY II KMC-2 July 2020, and support to the writing of many other accepted proposals. Beamtimes attended:

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|---------------|--|
| 06/2016 – now | Operando X-Ray absorption spectroscopy (XAS) measurements at Bessy II, Berlin (DE) at three beamlines: $\mu$ - spot (June 2016, October 2016), KMC-2 (July 2020) and BAMline (August 2021). Data analysis using the software Athena and Artemis, including fit of the EXAFS region.  |
| 12/2015 – now | Operando wide angle X-ray scattering (WAXS) measurements at ESRF, Grenoble (FR) at ID31 beamline (December 2015, May 2016, July 2016, May 2017, July 2017, October 2017) and DESY at P21.1 beamline (March 2022), Hamburg (DE) with experiments specifically designed for in situ pair distribution function (PDF) analysis. Data analysis including Rietveld refinement using the software Topas, structural visualization by VESTA and basic knowledge of Python. Detail knowledge of Origin Lab software. |

- **ORGANISATION OF SCIENTIFIC MEETINGS**

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|---------|---|
| 03/2019 | GAIA project, WP4 meeting. 12 participants. Berlin, Germany.    |
| 03/2018 | INSPIRE project, WP3 meeting. 11 participants. Berlin, Germany. |
| 09/2016 | INSPIRE project, WP3 meeting. 10 participants. Berlin, Germany. |

- **REVIEWING ACTIVITIES**

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|------------|--|
| 2016 – now | Reviewer for: Nature (Communications, Materials, Catalysis), Energy Environ. Sci., Adv. Funct. Mater., ACS Energy Lett., J. of Mater. Chem. A, and more. |
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- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

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|------------|---|
| 2020 – now | DECHEMA, GDCh and GeCatS.   |
| 2019 – now | Research Network “ <i>UniSysCat, Unifying Systems in Catalysis</i> ”, Berlin, De. |
| 2015 – now | ISE - International Society of Electrochemistry.                                  |
| 2018 – now | ECS - The Electrochemical Society.  |

- **INVITED CONFERENCES AND WORKSHOPS**

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|---------|--|
| 12/2021 | <b>GDCh</b> Lunch Talks Electrochemistry: Online seminars of the GDCh.             |
| 10/2021 | 240 <sup>th</sup> <b>ECS</b> meeting, Orlando (US), invited talk.                  |
| 06/2021 | CINE Online Workshop (BR), invited talk.   |
| 12/2019 | 2019 <b>MRS</b> - Materials Research Society - meeting, Boston (US), invited talk. |
| 07/2019 | 47th <b>IUPAC</b> World Chemistry Congress (WCC), Paris (Fr), invited Lecture.     |
| 06/2019 | “Materials for today’s energy challenge” workshop, UniPd (I), invited talk.        |
| 03/2019 | Invited talk by Prof. Freddy Kleitz, University of Vienna (A).                     |
| 10/2018 | 680th <b>WE-Heraeus</b> -Seminar, Bad Honnef (DE), invited contribution talk.      |
| 10/2018 | Invited talk by Prof. Varela, Instituto de Química, UNAM, Mexico City (MX).        |

11/2016

Invited talk by Prof. Bandarenka at the Technical University of Munich (DE).

- **LANGUAGE SKILLS**

English (fluent), German (intermediate, B2), Italian (native speaker), Spanish (full understanding, intermediate speaking), Danish (basics, A1/A2).

- **SCIENTIFIC PUBLICATIONS SUMMARY**

Author of 35 papers, including the journal Science and journals from the Nature publishing group: 11 as first author, 5 as corresponding author (two of which in Nature Communications and one in Angewandte Chemie). Total number of citations: 4242, of which already more than 1450 in 2022. H index: 24 (source: Google Scholar, 10/01/2023).