

Curriculum vitae and track record

PERSONAL INFORMATION

- Family name, First name: Sparta, Manuel
- Date of birth: 29.06.1979
- Sex: Male
- Nationality: Italian

Researcher unique identifiers: ORCID: 0000-0003-4218-5229, ResearcherID: A-5898-2009

KEY QUALIFICATIONS

I am a research scientist with a strong background in ab-initio modelling. I use computational methods to bring insight and understanding to problems of the process and metallurgical industries. I am proficient with Multiphysics and general-purpose software (COMSOL) with specialization in Computational Fluid Dynamics, Heat Transfer and Electromagnetic simulations. I apply Discrete Element Methods for the description of granular flow. I have studied catalytic and enzymatic reactions using quantum mechanical simulations and molecular dynamics. I have contributed to the development of scientific codes and, and I use scripting Python for scientific computing, data analysis and data visualization.

EDUCATION

- 2007 PhD: **Disputation date: 25.06.2007.**
Faculty of mathematics and Natural Sciences, Department of Chemistry,
University of Bergen, Norway
- 2003 Master in Chemistry.
Department of Chemistry, University of Ferrara, Italy

CURRENT AND PREVIOUS POSITIONS

- 2019- Senior Researcher
Modelling and Simulation, NORCE – Norwegian Research Centre / Norway
- 2016-2018 Researcher
Modelling and Simulation, Teknova / Norway
- 2012-2015 Postdoc
Max Planck Institute for Chemical Energy Conversion. Germany
- 2010-2012 Postdoc
University of California Los Angeles (UCLA), California
- 2007-2010 Postdoc
University of Aarhus, Denmark

PROJECTS (SELECTED)

- 2021-2025 Project Leader. Electrical Conditions in Submerged Arc Furnaces – Identification and Improvement (SAFECI) is an interdisciplinary project where we combine physics and data-driven modelling with sound metallurgical knowledge, to establish new tools to identify and control the conditions within smelting furnaces.
- 2019-2020 Project Contact at NORCE. Reduction of scaling in the roasting process reactors (Glencore Nikkelverk AS). The roasting process is an essential step in the production of copper. The furnaces used in this process undergoes periodical shutdown to remove a thick layer of solid deposit (scaling) that builds up on the internal walls. The mechanisms leading to scaling are not fully understood. The

- project aims at understanding the scaling mechanisms and suggest fundamental strategies to reduce it.
- 2018-2019 Project Contact at NORCE. A contactless power and data transeiver connector for subsea instrumentation, environment surveillance and fishfarming (Blue Logic AS). The project aims to develop a new generation contactless power and data transeiver connection system for subsea and marine applications.
- 2017-2020 Silicon production with no CO₂ emission, by closing the furnace (Elkem AS). The project aims at developing a significantly more energy-efficient concept for producing silicon alloys with no direct CO₂ emissions from the production furnaces.
- 2016-2021 Electrical Conditions and their Process Interactions in High Temperature Metallurgical Reactors (EIMet) is a competence project to establish a detailed understanding of how the conditions in an electrical smelting furnace are influence by 3-phase alternating current.

Track record

30+ publications in peer-reviewed scientific journals. Representative selection:

- An Overall Furnace Model for the Silicomanganese Process. Sparta, M., Risinggård, V.K., Einarsrud, K.E. et al. *JOM* **2021** 73, 2672–2681
- Metamodeling of the electrical conditions in Submerged Arc Furnaces. Manuel Sparta; Damiano Varagnolo; Kristian Stråbø; Svenn Anton Halvorsen; Egil V. Herland; Harald Martens. *Metallurgical and Materials Transactions B.* **2021**, 52 1267-1278.
- Skin and Proximity Effects in Electrodes and Furnace Shells. Egil V. Herland; Manuel Sparta; Svenn Anton Halvorsen. *Metallurgical and Materials Transactions B.* **2019**, 50, 2884-2897.
- 3D models of proximity effects in large FeSi and FeMn furnaces. Egil V. Herland; Manuel Sparta; Svenn Anton Halvorsen. *Journal of the Southern African Institute of Mining and Metallurgy* **2018**, 118 (6), 66-618.
- Granular flow described by fictitious fluids: a suitable methodology for process simulations. Manuel Sparta; Svenn Anton Halvorsen *Proceedings of the 12 2 th International Conference on Computational Fluid Dynamics in the Oil & Gas, Metallurgical and Process Industries.* **2017**, 593-598
- Exploring the Accuracy Limits of Local Pair Natural Orbital Coupled-Cluster Theory. Dimitrios G. Liakos, Manuel Sparta, Manoj K. Kesharwani, Jan M. L. Martin, and Frank Neese. *Journal of Chemical Theory and Computation* **2015** 11 (4), 1525-1539 DOI: 10.1021/ct501129s
- An adaptive density-guided approach for the generation of potential energy surfaces of polyatomic molecules. Manuel Sparta, Daniele Toffoli, Ove Christiansen. *Theoretical Chemistry Accounts* **2009**, 123 (5–6), 413–429
- Toward Accurate QM/MM Reaction Barriers with Large QM Regions Using Domain Based Pair Natural Orbital Coupled Cluster Theory. Giovanni Bistoni, Iakov Polyak, Manuel Sparta, Walter Thiel, and Frank Neese. *Journal of Chemical Theory and Computation* **2018** 14 (7), 3524-3531. DOI: 10.1021/acs.jctc.8b00348
- Mechanism of Olefin Asymmetric Hydrogenation Catalyzed by Iridium Phosphino-Oxazoline: A Pair Natural Orbital Coupled Cluster Study. Manuel Sparta, Christoph Riplinger, and Frank Neese. *Journal of Chemical Theory and Computation* **2014** 10 (3), 1099-1108. DOI: 10.1021/ct400917j