

# Andrea Strazzolini

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## Research interests

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Metal oxides redox chemistry, gas-solid reaction kinetics, numerical modelling of catalytic systems, chemical reactors and process design.

## Education

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- Nov. 2021 – Oct. 2024 **PhD in Energy and Environment Engineering Science**  
University of Udine, Italy  
“New oxygen carriers for efficient syngas and H<sub>2</sub> production by chemical looping steam methane reforming”  
Design, characterization, and testing of Ni-promoted Fe-based redox-active materials for CH<sub>4</sub> conversion processes.
- Oct. 2018 – Mar. 2021 **Master’s degree in Chemical and Sustainable Processes Engineering**  
Polytechnic University of Turin, Italy  
Final mark: 108/110  
“Computational fluid dynamics-based data-driven models for chromatographic applications”  
Development of a machine learning application for the determination of solid-liquid heat transfer coefficient in random packed chromatographic columns based on fluid dynamics simulations.
- Oct. 2015 – Sep. 2018 **Bachelor’s degree in Chemical and Materials Engineering**  
University of Padova, Italy  
Final mark: 106/110  
“Ni/Ce<sub>1-x</sub>Zr<sub>x</sub>O<sub>2</sub>-based electrocatalysts for biogas-fuelled solid oxide fuel cells”  
Synthesis and evaluation of the electrochemical activity of cermet anodes for power production from biogas in solid oxide fuel cells.

## Publications

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- Sep. 2024 Strazzolini, A.; Orsini, F.; Cannone, S. F.; Ferrero, D.; Boaro, M.; Llorca, J.; Dimitrakopoulos, G.; Trovarelli, A.; Santarelli, M.; Ghoniem, A. Methane Assisted Chemical Looping Water Splitting Performance of Sr<sub>2</sub>FeMo<sub>0.6</sub>Ni<sub>0.4</sub>O<sub>6-δ</sub> Double Perovskite for Solar Fuels Production. *SolarPACES Conf Proc* 2024, 2. <https://doi.org/10.52825/solarpaces.v2i.907>

## Professional experience

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- Dec. 2024 – Present **Research fellow – Catalysis lab, University of Udine (Udine, Italy)**  
**Main activities:** Development of mathematical models for the performance prediction of integrated CO<sub>2</sub> capture and methanation processes. Ceramic materials preparation, characterization, and testing. Development of ad-hoc numerical methods for kinetics predictions.
- Nov. 2021 – Oct. 2024 **PhD student – Catalysis lab, University of Udine (Udine, Italy)**  
**Main activities:** preparation of ceramic materials with various wet synthesis techniques, materials characterization with conventional (N<sub>2</sub>-physisorption, XRD, TPR, TGA, Raman spectroscopy, DRIFTS, XPS, SEM, TEM) and non-conventional (in situ synchrotron XRD) techniques, solid-gas reaction kinetics modelling, reactivity testing at ambient and non-ambient pressure in dynamic conditions, scientific writing.  
**Other activities:** Teaching and organization of laboratory experiences in undergraduate courses (“industrial process instrumentation”, University of Udine, “separation processes engineering”, University of Trieste), tutoring activities in undergraduate courses (“organic chemistry”, University of Udine)
- Apr. 2021 – Oct. 2021 **Junior process engineer – Ferriere Nord (Osoppo, Italy)**  
**Main activities:** Assist the process technologists in the supervision of the steel production and hot rolling departments, scrap yard operator, maintenance of refractory linings and milling equipment.
- Jun. 2020 – Mar. 2021 **Internship – GSK Vaccines (Siena, Italy)**  
**Main activities:** Random packed bed modelling with rigid body simulations, fluid dynamics simulation of flows in packed beds, parallel computing in HPC clusters, development, training and testing of multilayer neural networks.
- Mar. 2018 – Sep. 2018 **Internship – Catalysis lab, University of Udine (Udine, Italy)**  
**Main activities:** preparation of ceramic materials with wet synthesis techniques, preparation and assembly of button-type solid oxide cells, catalytic and electrochemical activity evaluation with conventional techniques (GC, CV, EIS).

## Conferences and workshops

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- Oct. 2024 **“7<sup>th</sup> international conference on chemical looping” – Banff, Canada**  
“Enhanced oxygen carriers for chemical looping steam methane reforming prepared by physical mixing”  
Oral contribution
- Jul. 2024 **“18<sup>th</sup> international congress on catalysis” – Lyon, France**  
“Composite Ca<sub>2</sub>Fe<sub>2</sub>O<sub>5</sub>-Ni/Ce<sub>x</sub>Me<sub>1-x</sub>O<sub>2</sub> oxygen carriers for Chemical Looping CH<sub>4</sub> Steam Reforming”  
Poster presentation
- Jun. 2024 **“Economy revolution by H<sub>2</sub>” workshop – Udine, Italy**  
Organizing committee member
- Aug. 2023 **“15<sup>th</sup> European congress on catalysis” – Prague, Czech Republic**  
“Enhanced Ca<sub>2</sub>Fe<sub>2</sub>O<sub>5</sub> Composites for Chemical Looping Reforming of Methane”  
Oral contribution

## Other professional skills

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Languages	Italian, mother tongue Proficient in written and spoken English (TOEFL 106/120, May 2023) Basic knowledge of French
Computer skills	MS Office applications (Word, PowerPoint, Excel, Access) Computational fluid dynamics software (OpenFOAM, Ansys Fluent) Basic process control and automation (Arduino, LabView) Data analysis and visualization (Python, Matlab) Process modelling (Aspen Plus)
Soft skills	Communication and public speaking, adaptability

Autorizzo il trattamento dei dati personali nelle modalità previste dal Regolamento UE 2016/679.

Place and date:

UDINE, 06/12/24

Signature: