

# Somayyeh Rakhshani

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## Physics and Nanotechnology Engineer

### Research Interests & Experiences:

Renewable energies, Ion exchange water electrolysis, Membrane production and characterization, photovoltaic (fabrication, and characterization of semiconductor devices), risk assessment, and radiation protection.

### Education:

#### 2022 **Ph.D. student in Electrical, Materials, and Nanotechnology Engineering**

Sapienza University of Rome, Italy

**Research topic:** Electro-Spun Materials for the Development of Sustainable mobility and Energy Storage

#### 2020 **Master of Science (M.Sc.), Nanotechnology Engineering**

Sapienza University of Rome, Italy

**Thesis:** Transparent Selective Contact Layers for Heterojunction Solar Cells on Crystalline Silicon. Final Grade:106/110

#### 2007 **Master of Science (M.Sc.), Nuclear Physics**

University of Arak, Arak, Iran

**Thesis:** The Shield Analysis of Irradiation Room for FDG and Kr-81m Production.

#### 2004 **Bachelor of Science (B.Sc.), Applied Physics**

Islamic Azad University – Mashhad Branch, Mashhad, Iran

### Work Experience:

#### 12/2020- 2/2021: **Internship** at **Sapienza University of Rome**

Microelectronic Lab is one of the laboratories in the department of information engineering, electronics, and telecommunication.

#### **Responsibility & Achievement:**

I was involved in the characterization of thin films of new materials as carrier selective contacts for application in Si-based heterojunction solar cells.

#### 9/2019-5/2020: **Traineeship** at **photovoltaic laboratories @ ENEA Research Center, Rome**

ENEA is the Italian national agency for new technologies, energy, and sustainable economic development. Photovoltaic labs focus on the research, design, and construction of photovoltaic

devices based on conventional materials such as monocrystalline, polycrystalline, and amorphous silicon.

#### **Responsibility & Achievement:**

My experimental thesis was done on new materials as selective contacts in Heterojunction Solar Cells on Crystalline Silicon. I was involved in the material characterization of thin films by transmittance and reflectance, conductivity and activation energy measurements, and optoelectronic characterization of Si-based heterojunction solar cells by I-V features and quantum efficiency measurements. I worked with Silicon wafers during the process of cleaning, wet chemical treatment in a clean room and passivation, and then deposition of different thin films. I demonstrated the feasibility of a-SHJ with NiLiO as the hole selective layer.

#### **2008-2017: Control Project Engineer at Radiation Application Institute, Tehran, Iran.**

The institute's main mission is to research on design and construction of material irradiation systems and the development of applicable research from lab scales to industrial scales.

#### **Responsibility & Achievement:**

I was responsible for risk assessment and radiation protection. I also worked as a control project engineer and I was responsible for evaluating the research projects, setting the timing schedules, executive monitoring, documentation, and making reports. I also collaborated in developing national standards for radiation application.

#### **Language skills:**

<b>English:</b>	Fluent
<b>Italian:</b>	Beginner
<b>Persian:</b>	Native

#### **Publication:**

1. **Lithium Doped Nickel Oxide as Hole Transport Layer for Heterostructure Solar Cells**, *F. Menchini, L. Serenelli, S. Rakhshani, L. Martini, A. Latini, G. de Cesare, D. Caputo, E. Salza, G. Stracci, M. Izzi, M. Tucci*, (presentation at the EU PVSEC 2020, the 37th European Photovoltaic Solar Energy Conference and Exhibition), Sep 2020.
2. **Synthesis and Characterization of a Composite Anion Exchange Membrane for Water Electrolyzers (AEMWE)**, *Somayyeh Rakhshani, Rodolfo Araneo, Andrea Pucci, Antonio Rinaldi, Chiara Giuliani, and Alfonso Pozio*, *Membranes* **2023**, *13*, 109. <https://doi.org/10.3390/membranes13010109>
3. **Lithium-doped nickel oxide grown by different PVD methods for hole-selective contacts in silicon-based heterojunctions.**

F. Menchini, S. Rakhshani, L. Serenelli, L. Martini, E. Salza, P. Mangiapane, A. Latini, M. Izzi, M. Tucci, (the EU PVSEC 2023)