NOUHAILA BENKOHAILA

Passionate about science and technological innovation, with a strong foundation in Photonics, Integrated Optics, Renewable Energies, and Electronics. Seeking a challenging role within a forward-thinking organization to apply my skills in R&D, with a goal to drive advancements in sustainable technology and develop innovative solutions.

CONTACT

Phone number: +212 6 69 83 26 53

Email: nouhailabenkohaila@gmail.com

Mobility: Open to global relocation

LinkedIn: www.linkedin.com/in/nouhaila-benkohaila-709178327

ResearchGate : https://www.researchgate.net/profile/Nouhaila-Benkohaila

WORK EXPERIENCE

Foton Institute, France ⬧ June. 2021 – January. 2025

PhD Researcher

Development of integrated optical sensors for the mid-infrared based on Chalcogenide glasses (ChGs) and Porous Silicon (Psi) Plateforms.

- **Simulated light propagation in porous and bulk materials using FDTD (Finite-Difference Time-Domain) and EME (Eigenmode Expansion) methods**
- **Designed and optimized waveguide structures for integrated photonic circuits using FimmWave and Lumerical, including Multi-Mode Interferometer (MMIs), ridge waveguides, Tapers.**
- **Proficiently used numerical simulation software such as MATLAB and Python to develop optical system models.**
- **Conducted a comparative performance analysis of optical sensors based on photonic circuits, focusing on sensitivity, limit of detection (LoD), and compactness.**
- **Analyzed data obtained from simulated photonic devices and used it to calibrate simulation models.**
- **Cleanroom devices fabrication: Fundamental techniques like lithography, deposition, and etching.**
- **Conducted research, published peer-reviewed papers on nonlinear optical phenomena in photonic circuits.**
- **Collaborated with cross-disciplinary team on next-generation photonics integrated circuits and sensing systems.**

OCP Group – Morocco⬧ March - July. 2020

R&D engineer (Graduation Internship)

The internship contributes to the design and integration of a hydrogen fuel cell system to power utility vehicles and integrated with solar power to achieve a more consistent energy output.

- **State-of-the-art on hydrogen production.**
- **Designed and integrated a hydrogen fuel cell system to power utility vehicles.**
- **Optimized a PV/PEM system, increasing hydrogen production.**
- **Evaluated the performance of a system that uses the electrical output from PV panels for electrolysis.**
- **Developed computational models and simulations of a PEM electrolyzer system for hydrogen production using MATLAB and COMSOL Multiphysics**
- **Researched and evaluated components for the "balance of plant," including hydrogen storage, pumps, and power conditioning systems**

NOOR Complex Solar Ouarzazate – Morocco ⬧ April - June 2018

Technical Assistant (Internship)

Sizing of an off-grid solar photovoltaic installation for the **NOOR 3** solar power plant temporary construction site to reduce the burdensome expenses of the existing public installation.

- **Conducted a solar resource assessment, including analyzing historical solar irradiation data for the site location**
- **Calculated the total daily and peak energy consumption in kWh for temporary construction site needs, including lighting, offices, and equipment.**
- **Designed a system incorporating a solar photovoltaic (PV) array, a battery bank for energy storage, and a charge controller to manage power flow.**
- **Selected appropriate solar PV panels based on efficiency, sized the battery bank to ensure a minimum of 1-3 days of autonomy, selected an appropriately sized inverter and charge controller to match the PV array and battery bank specification.**
- **Produced a comprehensive technical report detailing the system design, component specifications, and performance calculations.**
- **Developed practical proficiency in PVSys Software.**

EDUCATION

University Cadi Ayyad ⬧ February. 2021 - January. 2025

PhD in Material Sciences and Photonics

Focused on advanced photonic devices and optical systems design.

Hassan II University of Casablanca ⬧ September. 2018 - December. 2020

M.S. Renewable Energies and Energy Systems

Focused on solar, wind, biomass, and other renewable energy sources, energy storage solutions, smart grid technologies.

Hassan II University of Casablanca ⬥ November. 2016 – July. 2018

B.S. Solar and Wind Energy
 Specialized in implementing sustainable energy solutions using solar and wind power.

Al Khouarimzy High School ⬥ September. 2014 - June 2016

Advanced Technician Certificate (BTS). Electronic Systems
 Focused on integrated hardware and software systems designed to process electrical signal.

CORE SKILLS

Optics and Photonics: Simulation Software (Lumerical, Comsol, FimmWave), Experimental Validation, Materials Science, Data Analysis, Zemax, Code V, PIC Layout design (KLayout), Photonic Integrated Circuits, Optical testing.

Energetics and Renewable Energies: renewable energy technologies (PV et thermoelectricity, fuel cells et electrolysis, solar, wind), software proficiency (PVSys, SAM, RetScreen), energy storage, grid integration, Energy efficiency.

Electronic: CAD software (SolidWorks, AutoCAD), Matlab Simulink, Image acquisition, Analog-to-digital converter (ADC), FPGA, (AM, PM and FM) Modulation, RS231, I2C, Microcontroller, VHDL, Digital Signal Processing.

Programming Languages: Matlab, Python, Maple.

Languages: French (C1) – English (B2/C1) - Spanish (A2) - German (currently learning).

Soft Skills: Critical Thinking, Problem-Solving, Effective Communication (written and oral), Project Management and Collaboration.

PUBLICATIONS AND CONFERENCES

Nouhaila Benkohaila et al., « Design of an Optical Gas Sensor Based on Chalcogenide (ChG) Glass Platform in the Mid-Infrared for Detection of CO2 and CO », Optical and Quantum Electronics 56, no 10 (19 september 2024): 1609, | 2024

Theoretical Study of a Mid-Infrared Chalcogenide Glass Optical Sensor Based on a Ridge Waveguide - 12th INTERNATIONAL MARDIN ARTUKLU SCIENTIFIC RESEARCHES CONFERENCE / Mardin, Türkiye| August 17-19,2024

Development of integrated optical sensors for the mid-infrared - 2th National Conference on Fundamental and Applied Physics / Safi, Morocco | March 18-19,2022

ACADEMIC PROJECTS

Modeling and Simulation of a Solar Dryer Using Natural Convection in TRNSYS
- Developed a TRNSYS model to analyze the performance of a solar dryer with an auxiliary electric heater, simulating its performance under different climatic conditions.
- Used the software to identify optimal operating parameters, resulting in a **16.9 %** improvement in system performance.

Statistical Study of the Wind Energy Sector in Morocco and Development Prospects
- Conducted a comprehensive statistical analysis of the wind energy sector in Morocco, highlighting its current status, growth trends, and regional distribution of installed capacity.
- Analyzed the relationship between economic growth and wind energy production.

Study of the Constraints on Integrating Wind Generation into the Smart Electricity Grid
- Investigated and quantified the technical constraints of integrating high levels of variable wind energy into existing smart grid infrastructure, identifying key issues such as **voltage** and **frequency** regulation.
- Researched the impact of intermittent wind generation on grid performance.

CERTIFICATES

Programming for Everybody -Getting started with Python- (Coursera)|CERTIFICATE   January 2023
- Mastered fundamental Python syntax, proficiently utilizing control flow, loops, functions, and data structures.

Learning Data Analytics: 1 Foundations (LinkedIn Learning)|CERTIFICATE   July 2025
- Developed a comprehensive understanding of the data life cycle and various stages involved in the data analysis.
- Mastered data gathering, identification, and cleaning for analysis preparation.

The Cybersecurity Threat Landscape (LinkedIn Learning)|CERTIFICATE   July 2025
- Learned to protect against threats such as Malware, Phishing and Business Email Compromise (BEC).

VOLUNTEER EXPERIENCE

Community Support Volunteer - Basma Makers

Casablanca, Morocco | May 2015 - July 2016
- Helped prepare, package, and distribute meals to vulnerable populations, including the homeless and low-income households.
- Contributed to creating a welcoming and supportive environment during community outreach events.

Community Support Volunteer - Hope Givers

Casablanca, Morocco | July 2016 - November 2016
- Contributed to organizing social events for elderly people, helping promote community engagement and well-being.
- Organized and led social events for children, including games, crafts, and group activities, fostering creativity and social skills in a safe, inclusive environment.