Etienne Israel Palos | CV

Universidad Nacional Autónoma de México

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Education

Academic Qualifications

- **Universidad Nacional Autónoma de México** **Ensenada, BC**
  B.S., Nanotechnology with emphasis in (1) nanostructure and materials physics *2016-2020*

Research Interests

- **Condensed Matter Theory & Computation:** Electronic structure theory; DFT (multiple levels), Tight-binding, DMFT, GW
- **Materials Theory (Chhemical and Physical):** Semiconductors, Strongly correlated materials, Topological Insultaros and Superconductors, Transition Metal Chalcogenides

Research Experience

- **Universidad Nacional Autónoma de México (UNAM)**
  Materials Modeling Virtual Lab (LVMM) *2018 - Present*
  Computational materials discovery using first-principles methods: **(a) quantum materials**: feromagnetic 2D crystals for spintronic devices,and **(b) bulk semiconductors** data-driven discovery of transition metal chalcogenides for optoelectronics.
  Supervisor(s): Dr. Jonathan Guerrero-Sánchez (Associate Professor), Noboru Takeuchi (Lab head).
- **University of California at San Diego (STARS)** *Jun - August 2018*
  "STARS: Summer Training Academy for Research Success". Theoretical physical chemistry: deriviation of phenomenological models to describe polariton-exciton coupling in meta-surfaces (mathematical derivation as well as numerical computation).
  Supervisor: Joel Yuen-Zhou, Ph.D.
- **University of California at San Diego (NSF-SSSiN)** *Jul - August 2017*
  "SSSiN: Summer School for Silicon Nanotechnology". Electrochemical synthesis and surface chemistry of optically-active nanostructures. My responsibilities included computational wave-guide design for the electrochemical etching of porous silicon (p-Si) photonic crystals as well as organic functionalization of the p-Si surface.
  Advisor: Michael J. Sailor
- **Universidad Nacional Autónoma de México (JINyN)** *Jun - Jul 2017, and 2017 - 2018*
  Materials theory and computation.My project consisted of deriving a phenomenological tight-biding model to describe the electronic structure of the recently proposed ReCN. I continued my project and published the following article: *Phys. Scr.93 (11).115801.*
  Advisor: Donald H. Galván.

Publications

- **Etienne I. Palos**, José I. Paez, Armando Reyes-Serrato, Donald H. Galván. Electronic structure calculations of rhenium carbonitride: an extended Hückel tight-binding study. *Phys. Scr.* **93** (11). 115801. doi:10.1088/1402-4896/aae14c

- **Etienne I. Palos**, Roberto I. Hernández-Lima, Hector N. Fernádez-Escamilla, Jonathan Guerrero-Sánchez, Armando Reyes-Serrato and Gabriel Alonso-Nuñez. New ternary transition metal chalcogenide Na_2MoSe_4 is predicted to be a direct band-gap semiconductor suitable for optoelectronics. *In preparation *Presented at ACS San Diego**

Presentations

- **Etienne I. Palos**, *et al*. New ternary transition metal selenide Na_2MoSe_4: computational and experimental study. *ACS National Fall Meeting. Aug 25 - Aug 29, 2019. San Diego, CA.*
- **Etienne I. Palos**. Semiclassical Kronig-Penney model approach to polaritonic metasurfaces. *UCSD Summer Research Conference. Aug 17, 2018. La Jolla, CA.*
- **Etienne I. Palos** and Hunter Pauker. Hydrophobic porous Si based photonic-crystals for the detection of ethanol during fermentation. *NSF - SSSiN. Aug 17, 2018. La Jolla, CA.*

Honors and awards

- CONACyT Research-Assistantship: Theory and computation for experiments in materials chemistry: ternary transition metal chalcogenides. *J. Guerrero Sánchez and G. Alonso-Nuñez* March 2019 - Present.
- CONACyT Research-Assistantship: Physical chemistry of transition metal chalcogenides with potential applications in catalysis. *G. Alonso-Nuñez* March 2018 - March 2019.
- XVII National Prototype Competition: National Champion (Mexico). *For developing a computational platform for education in chemistry in Mexico and LatinAmerica. 2015. Aguascalientes, AGS, Mexico.*

Technical and Personal skills

- **Programming:** Bash (Linux Shell), Python, GNUplot, MATLAB, Wolfram Mathematica.
- **Technical software:** LaTeX, Microsoft Office, Solid Works
- **Computational Physics packages:** Quantum Espresso, Wien2K, YAeHMOP, XCrysDen, VESTA, Avogadro

Tutoring and outreach

- Computational Condensed Matter Club: Founder. I organize workshops and online seminars in theoretical condensed matter physics.
- Freshman and Sophomore mentor at CNyN UNAM through the academic tutoring program.
- Matematiké, A.C. : Instructor (2016 - 2018), workshop designer, tutor and manager. Matematiké is a non-profit organization founded by UNAM mathematicians and physicists.