

Nicholas Domingo Ignacio
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Research Interests

- Integration of 2D materials in PCM and RRAM for neuromorphic computing
- Crystalline-crystalline phase transformations for multilevel PCM.
- Electronic transport in low dimensional material devices
- Scanning transmission electron microscopy and scanning tunnelling microscopy (STM superuser at TMI)
- Materials science pedagogy

Education

- 08/2021 – current:** Ph.D. Candidate (advisor Prof. Deji Akinwande) Materials Science and Engineering Program and Texas Materials Institute, University of Texas at Austin, Austin, USA
- 01/2020 – 06/2020:** Visiting Student through Materials Exchange Program, University of Oxford, Oxford, UK
- 08/2017 – 06/2021:** S.B. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, USA

Awards, Honors & Certificates

- 09/2023:** Science Graduate Student Research (SCGSR) Fellow, U.S. Department of Energy, hosted by Oak Ridge National Lab, CNMS
- 06/2023:** Inclusive Classrooms Leadership, Division of Diversity and Community Engagement, University of Texas at Austin
- 02/2023:** K-12 Outreach Certificate, CDCM MRSEC, University of Texas at Austin
- 12/2022:** Professional Development Award, University of Texas at Austin
- 08/2021:** Virginia and Ernest Cockrell, Jr. Fellow, University of Texas at Austin

08/2021: T. W. Whaley, Jr. Scholarship, University of Texas at Austin

Professional Activities

Publications

- In Preparation:** M. Floto*, **N. D. Ignacio***, R. Ciufo, D. Akinwande, C.B. Mullins, Hydrogen-Induced Surface Reconstruction of Co(poly) Studied by STM
S. Kutagulla, C. Favela, **N. D. Ignacio**, N. H. Le, I. Terry, C. Bohn, B. Korgel, D. Akiwnande, Defect engineered single layer graphene for extended performance and range for fuel cell electric vehicles
- Prepress:** Y. Lee, Y. Hunag, Y.-F. Chang, S. J. Yang, **N.D. Ignacio**, S. Kutagulla, S. Mohan, S. Kim, J. Lee, D. Akinwande, S. Kim, Programmable Retention Characteristics in MoS₂-Based Atomirsotrs for Neuromorphic and Reservoir computing Systems, *ACS Nano* (2024) **In Review**
- 2024:** J. Xie, Md. Patoary, R. Laskar, Md. A. Rahman Laskar, **N. D. Ignacio**, X. Zhan, U. Celano, D. Akinwande, I. Sanchez Esqueda, Quantum conductance in vertical hexagonal boron nitride memristors with graphene-edge contacts, *ACS Nano Lett.* (2024)
- 2023:** **N. D. Ignacio**, J. Fatheema, Y. Jeon, D. Akinwande, Air-stable atomically encapsulated crystalline-crystalline phase transitions in In₂Se₃, *Adv Elec Matr* (2023)
S. Mohan, D. Kireev, S. Kutagulla, **N. D. Ignacio**, Y. Gu, H. Celio, X. Zun, D. Akinwande, K. Liechti, Direct, Metal-free Growth and Dry Separation of Bilayer Graphene on Sapphire: Implications for Electronic Applications, *ACS Appl. Nano Mater* (2023)
Y. Huang*, Y. Gu*, S. Mohan, A. Dolocan, **N. D. Ignacio**, S. Kutagulla, K. Matthews, A. Londoño-Calderon, Y.-F Chang, Y.-C. Chen, J. Warner, M.T. Pettes, J.C. Lee, D. Akinwande, Reliability improvement and effective switching model of thin-film MoS₂ memristors, *Adv Funct Mater* (2023)

* Denotes equal contribution

Conferences

Posters

11/2022: “Control of Crystalline-Crystalline Phase Changes in In₂Se₃ by Encapsulation”, Materials Research Society (MRS) Fall 2022 Meeting, (Boston, Ma, USA)

06/2022: “Hydrogen-Induced Surface Reconstruction of Co(poly) Studied by STM”, 82nd PEC Meeting 2022, (Chicago, IL, USA)

Member

American Society of Mechanical Engineers (ASME)

Materials Research Society (MRS)

American Physics Society (APS)

Teaching Experience

Introduction to Astronomy (AST301), Department of Astronomy, University of Texas at Austin (Spring 2023)

Materials Engineering (ME334), Department of Mechanical Engineering, University of Texas at Austin (Summer 2022)

Introduction to Solid-State Chemistry (3.091), Department of Materials Science and Engineering, MIT, (Fall 2019)

Service & Outreach

Reviewer for: ACS Nano, Journal of Emerging Investigators
(2023 – current)

08/2023 – current: UT Austin Materials Research Society President

08/2023 – current: UT Austin Graduate Engineering Council Materials Science representative

08/2023 – current: UT Austin Graduate Student Assembly Materials Science representative

09/2022 – 09/2023: Cockrell School of Engineering DEI board member

02/2022 – current: K-12 STEM outreach through UT MRSEC in local elementary schools

08/2021 – current: MIT Education Councilor (Interview prospective undergraduates)

08/2020 – 06/2022: MIT First year associate advisor

08/2020 – 06/2022: MIT Undergraduate associate advising steering committee member

06/2020 – 06/2022: Department Representative on DEI board of MIT Undergraduate Association

08/2020 – 06/2021: Vice President of Society of Undergraduate Materials Scientists at MIT

08/2018 – 08/2021: Department of Materials Science Freshmen Pre-orientation program mentor and coordinator

References

Dr. Deji Akinwande

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Last Updated January 2024