

Dissemination of Research Outcomes

The NSAM-ML Seminar Series is a weekly event where students and scientists from the consortium present their research outcomes, and scientists from NNSA Labs present their capabilities, current joint-project, student opportunities, and research proposals. Scientists, students, and partners from NNSA Labs discuss their research results and cooperation, as well as student opportunities in NNSA laboratories. Some of the given talks are highlighted.


March 9th, 2022




Perspective Study of Lead-free Piezoceramics for High-performance Electromechanical and Energy-harvesting Applications

Fazli Akram (Ph.D.)
Postdoc Mentor: Prof. Dr. Abdennaceur Karoui

E-mail: faakram@ncsu.edu, & faizliakram@gmail.com



Department of Mathematics and Physics / CREST center, North Carolina Central University, Durham, North Carolina, 27707, USA







The NCCU CNT Database
A Student Team Project For Discovery of New Smart Carbon Nanocomposites Using Machine Learning

Nixon W. Ogoi, Brandon Ma, Brianna S. O'Brian, Kristen Hauser, Oluwatoyin R. Atikekeresola, Ayobami Taiwo

Spring 2022 Research Internship, NSAM-ML
Mentors: Fouzia Sahtout, Gaolin Milledge, Abdennaceur Karoui

NSAM-ML project, NNSA-DOE
Center for Computing Research, Sandia National Labs
User Grant: Bridges-2, Pittsburgh Supercomputing Center, XSEDE



NSAM-ML Seminar Series

March 9, 2022

Dr Akram (NSAM-ML post doctoral Scientist at NCCU). Dr Akram work is part of the advanced manufacturing of smart materials for nanosensors.


Dr Karoui's students, NSAM-ML scholars presented their project on the development of the NCCU CNT database, which won the Best Paper prize at the Graduate and Undergraduate Research Symposium '2022.

NSAM-ML Seminar Series

Solar Energy Hydrogen Generation And CO₂ Conversion To Alternative Fuel

Bijandra Kumar, PhD,
Elizabeth City State University
Elizabeth City, NC

Dr Kumar, ECSU, presenting about his NSAM-ML electrochemistry research and education program focusing on hydrogen generation and CO₂ conversion using solar energy.



Improved hydrogen evolution reaction performance for sputter deposited molybdenum thin film electrocatalyst with dispersed platinum

Baleeswaraiiah Muchharla, PhD
Postdoctoral Researcher
Elizabeth City State University

Dr Baleeswaraiiah, post-doctoral scientist in Dr Kumar's group, ECSU, presenting about high performance photocatalysts for solar hydrogen generation.



NNSA
National Nuclear Security Administration

2022 Nuclear Security Advanced Manufacturing Enhanced by Machine Learning (NSAM-ML) seminar

MD, CALPHAD and DFT– a robust method for generating dataset for Refractory Multicomponent Alloys

Speaker: Congyan Zhang
March 30, 2022

Department of Computer Science
Southern University and A & M college
Baton Rouge, Louisiana 70807, USA



SOUTHERN UNIVERSITY

Application of Machine Learning Methods in design of Refractory High Entropy Alloys

Uttam Bhandari
Ph.D. student
Material Science and Engineering
Louisiana State University

Baton Rouge, LA, 70803
USA
March 30, 2022

NSAM-ML seminar, SUBR team, March 30, 2022

Dr Zhang (post-doctoral scientist, NSAM-ML, U. Bahandri, Ph.D. candidate, SUBR/LSU SUBR)



The Effective Potential-Quantum Mechanics, an efficient tool for studying the physics of quantum systems, Application to Quantum Dot Arrays

I. Filikhin*, A. Karoui, and B. Vlahovic

North Carolina Central University, Durham, NC 27707
*Corresponding Author, ifilikhin@ncsu.edu

NSAM-ML Seminar Series, Wednesday 03/23/2022



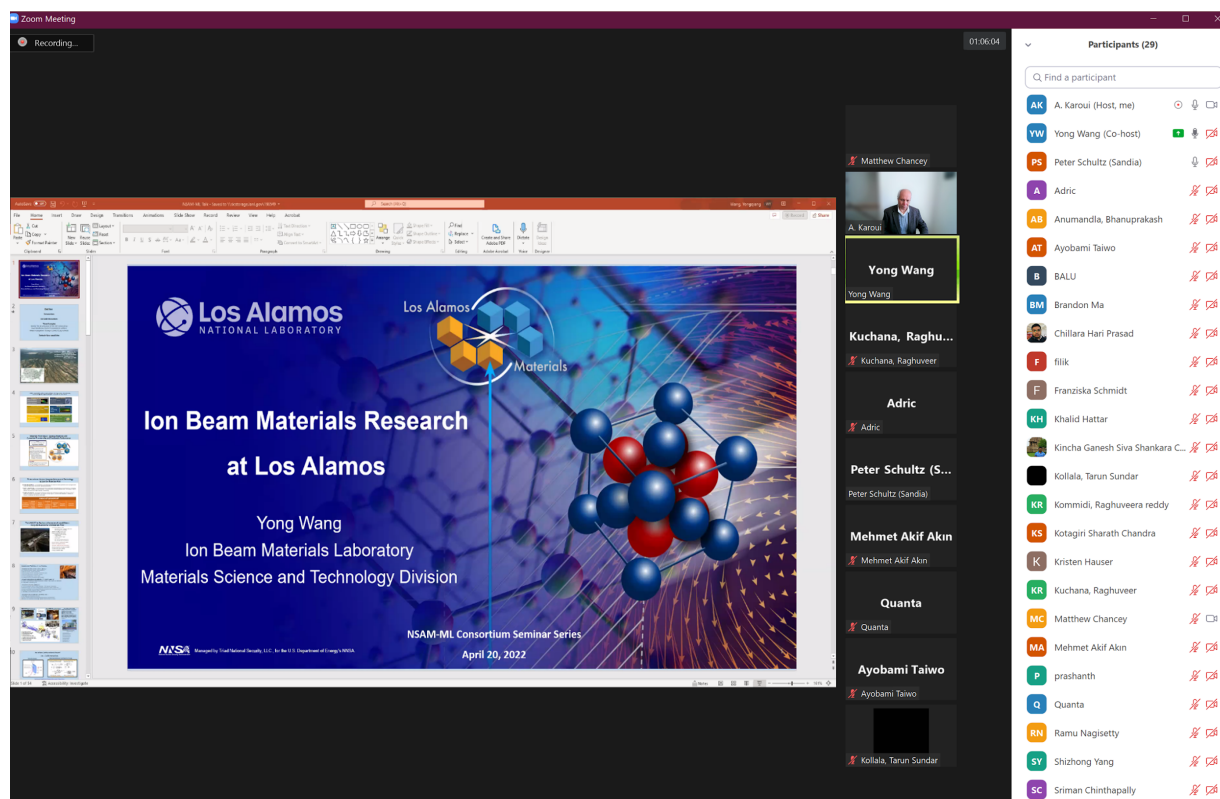
North Carolina Central University

EXCITONIC STATES IN AN ELLIPSOIDAL QUANTUM DOT WITH KANE'S DISPERSION LAW

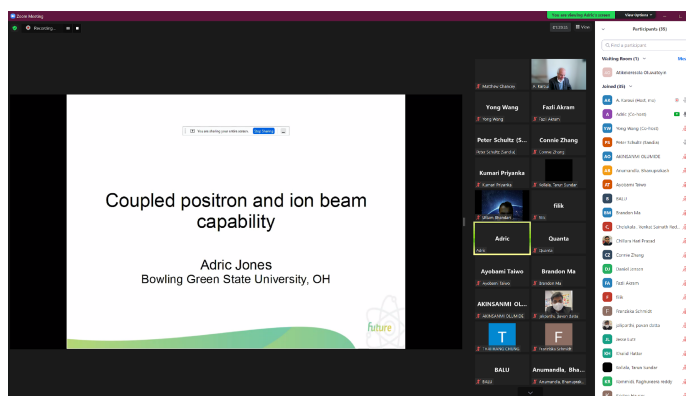
Karén Dvován, A. Karoui, B. Vlahovic
Department of Mathematics and Physics, North Carolina Central University,
1801 Fayetteville St., Durham, NC 27707, USA

NSAM-ML Seminar
March - 2022

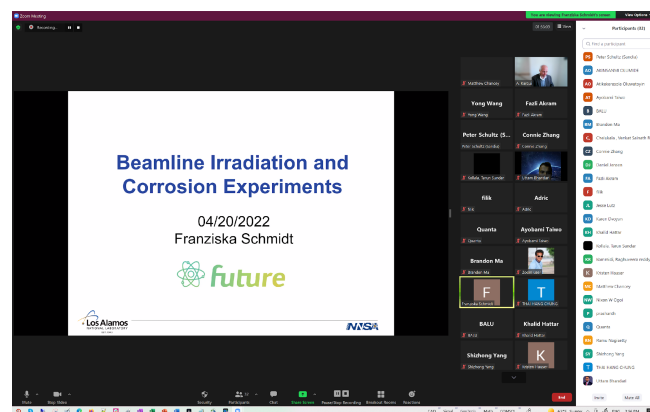
Dr B. Vlahovic, presenting theoretical work carried out for the NSAM-ML for understanding quantum dots and systems of quantum dots. Such preparatory work is essential for manufacturing quantum devices.



Dr Yong Wang, Director of the Ion Beam Materials Laboratory at LANL. Dr Wang will host NSAM Scholars for interns during summer 2022, and a graduate student from SUBR will spend four-months in Dr Wang's Lab for his Ph.D. research project.



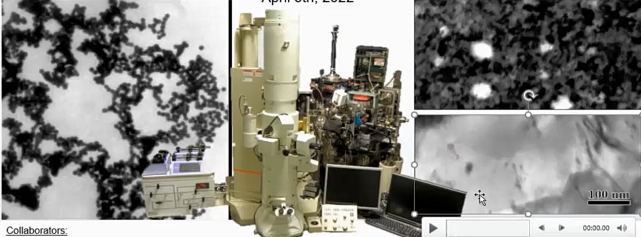
Dr Adric Jones, Dr Wang's group, IBML, LANL



Franziska Schmidt, Ph.D. candidate at the U of Berkeley, and visiting Dr Wang's lab, IBML, LANL.

Exploring Extreme Environments with Nanometer Resolution

K. Hattar
Sandia National Laboratories
April 6th, 2022



Collaborators:

- D. L. Butler, D. C. Bufford, S. H. Pratt, T. J. Boyle, B. A. Hernandez-Sanchez, S. J. Blair, B. Munifering, C. Chisholm, P. Hosemann, A. Minor, J. A. Hinks, F. Hibberd, A. Il'inyov, D. C. Bufford, F. Djurabekova, G. Greaves, A. Kuronen, S. E. Donnelly, K. Nordlund, F. Abdeljawad, S. M. Folles, J. Qu, C. Taylor, J. Sugar, P. Price, C. M. Barr, D. Adams, M. Abono, L. Treadwell, A. Cook, A. Monterrosa, IDES Inc, J. Sharon, B. L. Boyce, C. Chisholm, H. Bei, E. P. George, W. Mook, Hysitron Inc., G. S. Jawahararam, S. Dillon, R. S. Averback, N. Heckman, J. Carroll, S. Briggs, E. Carnes, J. Brinker, D. Sasaki, T. Nenoff, B. G. Clark, P. J. Cappillino, B. W. Jacobs, M. A. Hekmaty, D. B. Robinson, L. R. Parent, I. Arslan, & Protocore, Inc.

The work was partially funded by the Division of Materials Science and Engineering, Office of Basic Energy Sciences, U.S. Department of Energy. Materials Science and Engineering, Office of Basic Energy Sciences, U.S. Department of Energy. This work was performed, in part, at the Center for Integrated Nanotechnologies, an Office of Science User Facility operated for the U.S. Department of Energy (DOE) Office of Science. Sandia National Laboratories is a multi-program laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International, Inc., for the U.S. DOE's National Nuclear Security Administration under contract DE-NA-0002228. The views expressed in this article do not necessarily represent the views of the U.S. DOE or the United States Government.

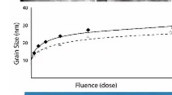
Dr K. Hattar, Senior Scientist CINT, SNL. Dr Khaled and his postdoc Dr. Madden cooperate with Dr Karoui on modification of nanomaterials in-situ of HR-TEM. Materials of interest to Dr Karoui and the NSAM-ML consortium include: HEA, piezoelectric ceramics, and photocatalysts.

CERAMIC INTERFACES AND THEIR RADIATION RESPONSE


Nathan J. Madden
NSAM-ML Seminar Series
4-6-2022

Materials' Response to Radiation
At higher doses, radiation can affect the material's microstructure and bulk properties

Microstructural changes



Void swelling



nm Increasing in scale cm

Dr J. Madden, post-doctoral Scientist, CINT, SNL.
Dr Madden is specialist in electron microscopy