

Xavier University-New York University/PREM

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NEW YORK UNIVERSITY MRSEC



Overview of Xavier University

- ❖ Located in New Orleans (crescent city), LA
- ❖ Founded by St Katharine Drexel (1925)
- ❖ Private liberal arts institution
- ❖ Primarily a teaching University
- ❖ Student population (~3500 Students)
- ❖ Predominantly Black (70%) (HBCU)
- ❖ Majority of students from the New Orleans area (60%)
- ❖ University has 2 colleges
 - ❖ College of arts and sciences (7 departments)
 - ❖ College of pharmacy



About The Chemistry Department

- ❖ 25 full time faculty
- ❖ Over 700 chemistry majors (< 1% ACS certified)
- ❖ Over 10 million dollars in grant funding (*NSF, NIH, DOD*)
- ❖ State-of-the art equipment for research (*FE-SEM, AFM*)
- ❖ Ranked by the ACS as one of the top 25 universities in awarding BS degrees in chemistry (*US Dept. of Education*)
- ❖ Rank first nationally in the number of African American students earning a chemistry degree
- ❖ A nationally recognized and award winning chemistry club affiliated with the ACS



Science Building



FE-SEM Hitachi S-4800

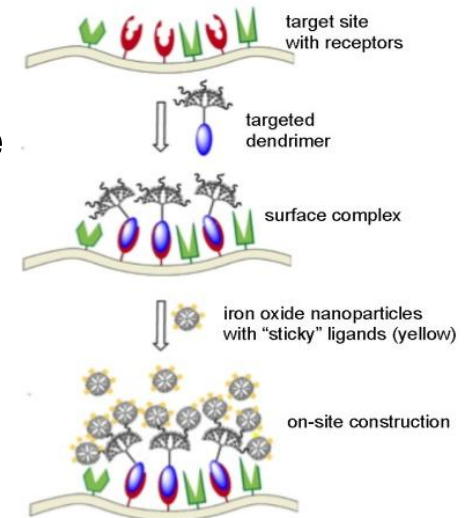
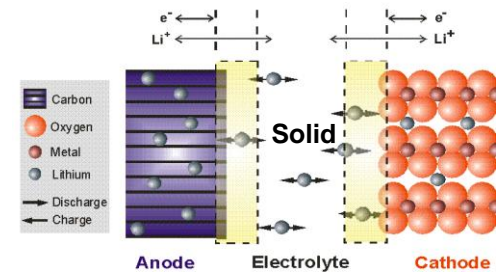


ACS-Chemistry club



Xavier - NYU/MRSEC proposed research

- ❖ Materials for energy Storage - (L. Meda, M. Ward, M. Weck)
Development of polymeric, solid electrolytes, composite cathode materials for lithium-ion rechargeable batteries.
- ❖ Magnetic assemblies - V. Kolesnichenko, J. Zhang, D. Pine, J. Canary, K. Kirshenbaum, M. Walters, A. Kent
Focus on nanometer-scale super-paramagnetic iron oxide particles surrounded by non polymeric biocompatible organic shells; provide greater mobility and diffusion for the imaging agent.
- ❖ Force measurements - (A. S. Meya, J. Brujic, D. Grier)
Investigate the surface morphology of cancer stem cells and interaction forces between specific molecules immobilized on the tip and the cell surface.
- ❖ Polymorphic materials - B. Bilyeu, C. Stevens, M. Ward
Polymorphic transitions in materials



Conceptual description of on-site construction of superparamagnetic



Relationship with the partner center

- ❖ Established collaboration between A. Sunda-Meya (Xavier, physics) and J. Brujic, D. Grier (NYU)
- ❖ Existing two-way student exchange program for outstanding undergraduates
- ❖ Summer Scholar-in-Residence at NYU); Mike Adams (chemistry), several biology and math professors
- ❖ Mutual interest in materials research and experimental investigation of nanoscale structures
- ❖ Create a pipeline of underrepresented undergraduates who are well-trained and qualified for graduate school with focus on materials research



Relationship between Xavier and NYU

- ❖ Students perform research at NYU during summer.
- ❖ Xavier faculty members accompany students (faculty/student pair).
- ❖ NYU graduate students will be paired with research teams at Xavier, including a one-month visit to Xavier that will ensure project continuity.
- ❖ Provides an important mentorship opportunity for NYU graduate students, in both the NYU and Xavier environment.
- ❖ To foster the collaborative long-term goals of Xavier and NYU, the FRN will host a biannual technical symposium during the Summer Scholar-in-Residence including faculty from other PREM institutions.



Education and outreach efforts

❖ Combined plan 3+2 engineering program in chemical, biomedical, mechanical engineering, between Xavier and NYU



❖ Summer Bridge Program for entering freshman students (8 weeks)

- *Mathematics* (precalculus or calculus)
- Non-class days focus on research
- Working closely with their research supervisor
- Overview of Intro to engineering and science



❖ Curriculum Development: Introduction to Science and Engineering, Materials Characterization, Advanced Materials Synthesis Lab

❖ Summer Science Academy (SSA): hands-on materials research-related activities for high school students in 11th grade

❖ American Chemical Society Chemistry Club Program: PREM take part in these programs



Increasing underrepresented groups in materials research

- ❖ Develop a Materials Science track in the ACS-certified Chemistry Program
- ❖ Early exposure to undergraduate research (*freshman year*)
- ❖ Recruitment (*J. Watson, M. Jones, J. Jones, S. Riddle, A. Dangerfield, X. Williams*)
- ❖ Provide summer research experiences (Xavier-NYU Faculty student Pair)
- ❖ Provide scholarships for qualified PREM students
- ❖ Assign each freshman and upper level students to a PREM mentor
- ❖ Required attendance to departmental seminar
- ❖ Research presentation at national meetings (MRS, ACS and ECS)



PREM Students



Scholarships

