

Moussa N’Gom

Assistant Professor
Physics, Applied Physics, & Astronomy
Rensselaer Polytechnic Institute
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Education

MAY 2009: PH.D. PHYSICS — Advisor: Theodore B. Norris

University of Michigan – Ann Arbor

Thesis: “Novel Approach to the Study of Surface Plasmon Resonance and Field Enhancement Properties of Noble Metal Nanostructures”

DECEMBER 1999: B.S. PHYSICS AND ELECTRICAL ENGINEERING,

University of Wisconsin – Milwaukee

Employment

Academic Appointments

ASSISTANT PROFESSOR OF PHYSICS

Department of Physics, Applied Physics, & Astronomy, Rensselaer Polytechnic Institute, 2018 – Present

ADJUNCT RESEARCH SCIENTIST [0% effort.]

Electrical and Computer Engineering Division, University of Michigan, 2018 – Present

ASSISTANT RESEARCH SCIENTIST

Electrical and Computer Engineering Division, University of Michigan, 2015 – 2018

Professional Appointments

Senior Research Scientist — Corning Incorporated — Oct 2011 – Sept 2015

Research Staff Member — Institute for Defense Analyses — June 2009 – Oct 2011

Optical Measurement Engineer — Corning Incorporated — Jan 1999 – June 2002

Teaching Experience

Professor of Physics: Electrodynamics (Graduate Course), RPI, Spring 2021

Professor of Physics: Introduction to Quantum Mechanics, RPI, Fall 2020, 2021

Professor of Physics: Fundamental of Optics (Undergraduate Course), RPI, Spring 2019

Teaching Assistant: Ultrafast Optics (Graduate Course), University of MI, Winter 2008

Awards and honors

NextProf Alumnus (2016)

Corning Incorporated: Safe Haven Award (\$50,000): “Mode Division Multiplexing in Few Mode Fibers”, 2015.

JASON Intern (Summer 2010; Study Leader: Professor Robert D. Grober – Yale University)

Horace G. Rackham Merit Fellowship, University of Michigan

Wisconsin Space Grant Consortium recipient, UW-Milwaukee

Tau Beta Pi honor society

Patents

- Application#: WO 2017/027784 A1 [Granted]
Title: Method and System for Printing 3D Objects
- Application#: 62/072,682 (Corning docket no. SP14-325) [Granted]
Title: Edge Sealing of Laminate Glass Using Laser Glass Welder
- Application#: US 14/993,236 (U.S. Attorney Docket No.: SP14-311) [Granted]
Title: Laser Cutting of Thermally Tempered Substrate
- Application# 61/917,092 (U.S. Attorney Docket No.: SP16-236) [Granted]
Title: Electrochromic Coated Glass Articles and Methods for Laser Processing The Same.
- Application#: 62/137,443 (U.S. Attorney Docket No.: SP15-107) [Granted]
Title: Laser Cutting and Processing of Display Glass Composition

Publications

“*A Method of Generating Knotted and Linked Gaussian Dots from Bessel Like Beams*”,

F. Buldt, P. Bassène, M. N’Gom

arXiv:2107.09662 [physics.optics] – under Editorial Review Optica.

“*Nonlinear Conversion of Orbital Angular Momentum States of Light*”,

P. Bassène, F. Buldt, N. Rumman, T. Wang, P. Heitert, M. N’Gom

arXiv:2105.12183 [physics.optics] – under peer review Opt. Exp.

“*Multi-Qubit Production in Spontaneous Parametric Down Conversion*”,

P. Heitert, F. Buldt, P. Bassène, M. N’Gom

arXiv:2105.05291 [quant-ph] – To be published in Phys. Rev. Appl.

“*Mode Control in a Multimode Fiber Through Acquiring its Transmission Matrix from a Reference-less Optical System*”,

M. N’Gom, T. B. Norris, E. Michielssen, and R. R. Nadakuditi

Optics Letters, Vol. 43, No. 3, 419 (2018)

“*Controlling Light Transmission Through Highly Scattering Media Using Semi-Definite Programming as a Phase Retrieval Computation Method*”,

M. N’Gom, M. B. Lien, N. M. Estakhri, T. B. Norris, E. Michielssen, and R. R. Nadakuditi

Nat. Sci. Rep. Vol. 7, No. 1, 2518 (2017)

“*Electron Beam Mapping of Plasmon Resonances of Electromagnetically Coupled Gold Nanorods*”,
M. N’Gom, S. Li, G. Schatz, R. Erni, A. Agarwal, N. Kotov and T. Norris
Physical Review B 80, 113411 (2009)

“*Exploring the Emerging Frontier at the Intersection of Optics and Electron Microscopy*”,
M. N’Gom and T. B. Norris, invited article S & T: SPIE Newsroom 10.1117/2.1200901.1493

“*Single Particle Plasmon Spectroscopy of Silver Nanowires and Gold Nanorods*”,
M. N’Gom, J. Ringnalda, J. F. Mansfield, A. Agarwal, J. Ye, N. Kotov, N. J. Zaluzec, T. B. Norris.
Nanoletters vol. 8, No. 10, 2008, 3200 – 3204.

“*Relation Between Quantum Tunneling Times for Relativistic Particles*”,
H. G. Winful, M Ngom, N. Litchinitser, Phys. Rev. A 70, 052112 (2004)

“*Parameterization of Inclusive Cross Sections from Pion production in Proton-Proton collision*”,
S. R. Blattinig, S. R. Swaminathan, A. T. Kruger, M. Ngom, and J. W. Norbury
Physical Review D. vol 62, pg 094030 (2000)

Conference Proceedings & Publications

“*Multi-qubit production in spontaneous parametric down conversion*”,
Oral Presentation; Control Number: 3625058
Frontiers in Optics + Laser Science Conference (FiO LS) 2021.

“*Nonlinear Conversion of Orbital Angular Momentum States of light*”,
Oral Presentation; Control Number: 3618371
Frontiers in Optics + Laser Science Conference (FiO LS) 2021.

“*Wavefront Shaping: A New Tool in Optics*”,
Invited Oral Presentation: Abstract Number: 152, Program Number: C3+C2+C1-ThM5
International Conference on Metallurgical Coatings and Thin Films (ICMCTF) 2019.

“*Non-Holographic Method to Compute the Transmission Matrix of a Multimode Fiber for Mode Control*”,
Oral Presentation: Postdeadline Papers I (FTh4A)
Frontiers in Optics (OSA) 2017; Postdeadline Papers: FTh4A.

“*Wavefront Shaping Through Scattering Media Using Semi-Definite Programming as a Phase Retrieval Computation Method*”,
Oral Presentation: Mathematics in Imaging
Imaging and Applied Optics Conference (OSA) 2017 paper: MTu2C. 2.

“*Plasmon Resonance Variation from Strongly Interacting Gold Nanorods*”,
Oral Presentation CLEO/QELS 2009 conference.
International Quantum Electronics Conference (IQEC) 2009 paper: JWE4

“*Enhanced Surface Third Harmonic Generation from Gold Nanorods*”,
Oral Presentation CLEO/QELS 2009 conference.
International Quantum Electronics Conference (IQEC) 2009 paper: IMK4.

“*Correlation Spectroscopy of Third-Harmonic Generation by Single Nanorods*”,
Conference on Lasers and Electro-Optics (CLEO) 2009 paper: CThK3.

“*Single Particle Plasmon Spectroscopy of Silver Nanostructures*”,
Oral Presentation CLEO/QELS 2008 conference.
Quantum Electronics and Laser Science Conference (QELS) 2008 paper: QFK4.

“*Electron Energy Loss Spectroscopy of Individual Noble Metal Nanostructures*”,

Oral Presentation OSA/Plamomics/Metamaterials 2008 conference.
Plasmonics and Metamaterials (META_PLAS) 2008 paper: MMC2.

Funding Sources

Project/Proposal Title: Free Space Optical Communication Through Dynamic Media
Source of Support: National Geospatial Intelligence Agency
Award Number: HM0476-20-1-0012
Total Award Amount: \$473,453
Start/End Date: Sept. 2020 to Aug. 2022

Service and Community Outreach

Students Supervised

Current Postdoc: Pascal Bassène

Graduate Students:

Current:

PhD Students: Finn Buldt, Viet Tran, Tianhong Wang, Joseph Daafour, Nazifa Rumman (ECE)

MS Students: Philip Heitert (PHY), Saad Bin Ali Reza (ECE)

Graduated:

MS Students: Taylor Jurgensen, Ameerah Jabr-Hamdan, [Philip Heitert, Saad Bin Ali Reza (expected Dec. 2021)]

Undergraduate Students:

Current: Kaitlin Jennings, Aaron Pearra

Former: Sam Goodwin (Industry 2019), Spencer Dimitroff (PhD Student U. of New Mexico 2019),

Angela Mehta (PhD Student Yale 2021)

Dissertation Committee

- Alexander Kaiser, “Design and Fabrication of Teepee Photonic Crystal for High-Efficiency thin film Solar Cell Architectures” Department of Physics, Applied Physics and Astronomy. Rensselaer Polytechnic Institute, Dec. 2021 (Advisor: Shawn–Yu Lin)
- Nathan Kimmitt, “Using Super-Resolution Imaging to Investigate the Coupling Dynamics of Single Emitters to Plasmonic Nanoantennas”, Department of Physics, Applied Physics and Astronomy. Rensselaer Polytechnic Institute November 5, 2020, (Advisor: Esther Wertz)
- Brandon D. Lucas, “Nano–imprint Lithography and its Applications in Photonics, Biotechnology and Energy Conversion Devices”, Department of Physics: Applied Physics Program, University of Michigan, May 20, 2016, (Advisor: Longjie Guo)

University Committees

Department:

Graduate Recruiting Committee (09/2018 – Present)
Physics Department Executive Committee (01/20 – Present)
APS Bridge program point of contact, Physics Department. (09/2018 – Present)
School of Science:
Review Committee for the Dean of Science, 2021
Dean’s Covid task force, School of Science (04/2020 ? 09/2020)
University
Faculty senator for the School of Science 2019 – Present
Search committee for University President, 2021

Proposal Reviewer

NSF (2018, 2019, 2020)

Journal Reviewer

Nanoletters, Applied Physics Letters, Optics Letters, Optics Express

Professional Affiliations

National Society of Black Engineers
National Society of Black Physicists.
Optical Society of America Member
American Physical Society Member
AAAS Member

Languages

OUOLOFF: Mothertongue
ENGLISH: Fluent
FRENCH: Native