

Nicholas Gogola

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Education

May 2021

GPA: 3.79/4.00

Master of Science in Forensic Science, University of New Haven, West Haven, Connecticut

- Thesis: “The Roles of Projectile Energy and Apparel Fabric Damage in Assessing the Magnitude of Long-Range Shooter Distances”
- Provost Assistantship Award recipient
- Relevant Courses: Physical Analysis, Advanced Criminalistics I & II (biological & chemistry/trace)
- Laboratory training in microscopy, spectroscopy, scientific laboratory operations and instrumentation

December 2018

GPA: 3.54/4.00

Bachelor of Science in Physics, University of Illinois, Urbana-Champaign, Illinois

- Relevant Courses: Physics, Chemistry, Mathematics, Biology, Introduction to Forensic Science
- Laboratory training in experimental physics, biological/microscopic concepts, and analytical/organic chemistry

Professional Experience

12/22-Present

Assistant Core Scientist, NUANCE Center, Northwestern University, Evanston, IL

- Facilitate student and external user trainings on numerous SEMs and sample preparation equipment
- Provide users with instrumentation assistance and optimized operating conditions recommendations
- Participate in science-based education and outreach initiatives
- Collaborate with external users to determine and conduct adequate sample analyses

10/21-11/22

Research Scientist II, Analytical Technology, Curia Indiana, West Lafayette, IN

- Provided timely support for the microscopic analysis of client samples
- Maintained microscopy instrumentation to ensure optimal instrument performance
- Provided expert scientific consulting and project oversight
- Complied with all cGMP and safety requirements as well as laboratory SOPs

08/19-12/19

Graduate Math Lab Tutor, University of New Haven: Center for Learning Resources, West Haven, CT

- Headed the Math Lab at the Center for Learning Resources (CLR) at the University of New Haven
- Tutored undergraduate students at the CLR in introductory Math, Chemistry and Physics
- Utilized online reservation program to manage sessions and provide feedback about student learning outcomes

Leadership

05/20-05/21

Treasurer, University of New Haven: Graduate Forensic Science Club, West Haven, CT

- Created and submitted an approved club budget to the Graduate Student Council for the 2020/2021 schoolyear
- Worked with the Center for Student Engagement, Leadership and Orientation to order supplies for club meetings
- Monitored the dues collection process for all club members
- Oversaw all monetary operations including the accounts, budgeting, and purchasing for meetings and events

Research Experience

01/20-05/21

Graduate Research Assistant, University of New Haven, West Haven, CT

- Research Project: “Soil Mineral Analysis by Particle Correlated Raman Spectroscopy (PCRS)”
- Assisted Dr. Brooke Kamrath in forensic soil analysis under NIJ Grant Award # 2019-DU-BX-0017
- Assessed the discriminative and comparative power of PCRS on forensically significant soil samples
- Operated Thermo Scientific DXR Raman Microscope and Horiba XploRA Raman Microscope for Raman spectral and morphological analyses of soil minerals and a vacuum powder dispersal unit for uniform dispersal of samples
- Evaluated the effects of soil sample preparation optimization on soil mineral analysis by PCRS
- Built a mineral spectral library of Cargille’s Mineral Reference Set using OMNIC spectral software package

08/19-05/21

Thesis Requirement, University of New Haven, Forensic Science Department, West Haven, CT

- Thesis Project: “The Roles of Projectile Energy and Apparel Fabric Damage in Assessing the Magnitude of Long-Range Shooter Distances”
- Defended novel thesis research project in compliance with FEPAC accreditation under advising of Peter Valentin
- Explored the roles of projectile energy and apparel fabric damage in assessing the magnitude of shooter distances in long-range firearms related incidents
- Categorized morphological features in apparel fabric bullet holes to develop a method for long range shooting distance estimations in forensic firearms examinations
- Employed stereo microscopic techniques to visualize microscopic morphology of bullet holes in apparel fabrics
- Operated polarizing light microscope to record birefringence and rapid shear dimensions in synthetic fibers

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01/19-04/19

SULI Intern, Material Science Division, Argonne National Laboratory, Lemont, Illinois

- Research Project: “Effects of high temperature annealing on the dielectric properties of Hafnium Oxide”
- Performed high-level research for Argonne National Laboratory through the Department of Energy’s SULI Internship program
- Gained experience on research grade scientific laboratory equipment and techniques including Rapid Thermal Processing, Electron Beam Lithography, SEM (EDS), Reactive Ion Etching, Spectroscopic Ellipsometer, Metallurgical Microscope, Profilometer, and more
- Utilized personal protective equipment compatible with an ISO5 (Class 100) cleanroom facility
- Composed a research poster and participated in Poster Presentation at the conclusion of appointment
- Authored Research Project Report detailing research processes and outcomes

Instrumentation Training

18 Months

Scanning Electron Microscopy

- Operated a Zeiss SEM equipped with Raith 150 electron beam lithography to pattern nanoscopic capacitor arrays into photoresist on Hafnium Dioxide wafers and assess the precision of capacitor formation via plasma etching with Reactive Ion Etcher for the completion of my research project titled “*Effects of High Temperature Annealing on the Dielectric Properties of Hafnium Oxide*”
- Investigated various API powder, granules, and additional contaminant samples on FEI Quanta 200 and Zeiss EVO 25 scanning electron microscopes for general characterization and elemental analysis for Curia Indiana, LLC
- Facilitated trainings for both students and external users on proper and relevant electron microscopy and associated microanalytical techniques on Hitachi S-3400N, Hitachi S-4800, Hitachi SU8030, FEI Quanta 650F, and JEOL JSM 7900FLV SEMs at Northwestern University Atomic and Nanoscale Characterization Experimental Center’s SEM facility at Northwestern University.

16 Months

Brightfield Microscopy

- Employed brightfield microscopy techniques, including comparison microscopy, as a mode of preliminary examination of various forensically relevant materials including but not limited to hairs, fibers, cordage, white powders, drug material, minerals, nail polish, and ballpoint pen inks for the course titled *Advanced Criminalistics II* administered by the University of New Haven
- Applied several brightfield microscopy techniques to the investigation of unidentified particles as it relates to pharmaceutical contaminant identification for Curia Indiana, LLC

12 Months

Stereomicroscopy

- Examined apparel fabric bullet holes with a Meiji stereomicroscope to categorize unique fabric and yarn level morphological findings in those holes formed by bullets fired from various long-range distances, for the completion of my thesis titled “*The Roles of Projectile Energy and Apparel Fabric Damage in Assessing the Magnitude of Long-Range Shooter Distances*” at the University of New Haven
- Operated Leica stereomicroscopes for the preliminary analyses of unidentified pharmaceutical contaminants, including tasks such as: particle isolation, particle washing, physical separation using tungsten needles, and sample preparation for additional microscopic analysis techniques for Curia Indiana, LLC

9 Months

Raman Microspectroscopy

- Operated Thermo Scientific DXR Raman Microscope for Raman spectral analysis of Cargille’s Mineral Reference Set as a Graduate Research Assistant under NIJ Grant Award # 2019-DU-BX-0017 for Dr. Brooke Kamrath
- Studied the sample preparation methods of forensically relevant soils using Horiba XploRa Raman Microscope and Horiba’s ParticleFinder application for Raman spectral and morphological analyses of soil minerals for the completion of my research project titled “*The Effects of Sample Preparation Optimization on Soil Mineral Analysis by Particle Correlated Raman Spectroscopy (PCRS)*” under NIJ Grant Award # 2019-DU-BX-0017 for Dr. Brooke Kamrath

6 Months

Polarizing Light Microscopy

- Surveyed the morphology of fiber level fractures and rapid shear among cotton and polyester fibers from the bullet holes in various apparel fabrics shot from numerous long-range distances, using a Leica DM EP polarizing light microscope to assess the dimensions and frequencies of different fiber fracture types for the completion of my thesis titled “*The Roles of Projectile Energy and Apparel Fabric Damage in Assessing the Magnitude of Long-Range Shooter Distances*” at the University of New Haven

5 Months

Fourier Transform Infrared Spectroscopy

- Analyzed numerous forms of trace evidence on a Thermo Scientific Nicolet is10 FTIR Spectrometer including but not limited to seized drugs, questioned powders, questioned fabrics and fibers, cordage, and automotive paint samples for the course titled *Advanced Criminalistics II* administered by the University of New Haven

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- Performed microspectroscopic analyses of numerous pharmaceutical contaminants with a Continuum infrared microscope using a KBr compression cell followed by spectral analysis using OMNIC v. 7.2 software for Curia Indiana, LLC

Additional Training and Experience

- Scanning Electron Microscopy and X-Ray Microanalysis course. Taught by 2023 Lehigh Microscopy School lecturers at Lehigh University, Bethlehem, PA. 5-day course (2023).
- EVO 25 SEM Training. Taught by Larry Kolodziejski of Carl Zeiss. 2-day training session held at Curia Indiana, LLC. (2022).
- Pharmaceutical Microscopy Techniques. Lecture by Robert A. Carlton, Ph.D., retired from Carlton Microscopy and Consulting, at Curia Indiana, LLC. 3 days of laboratory and lecture (2022).
- Horiba XploRa Plus Raman Microscope Training. Taught by Bridget O'Donnell and Andrew Whitley of Horiba Instruments Inc., at Horiba New Jersey Optical Spectroscopy Center, Piscataway, NJ. 2-day training session (2020).

Publications

- 1. **Gogola, N.**, Valentin, P. (2021, June). *The Roles of Projectile Energy and Apparel Fabric Damage in Assessing the Magnitude of Long-Range Shooter Distances*. Poster presented at the meeting of Forensic Science Symposium. Online.
- 2. Garvin, H., **Gogola, N.**, Brown, S., Maxwell, V., Reffner, J., DeForest, P., ... Kammrath, B. (2021, June). *Soil Mineral Analysis by Particle Correlated Raman Spectroscopy (PCRS): Sample Preparation and Raman Analysis Optimization*. Poster presented at the meeting of Forensic Science Symposium. Online.
- 3. Kammrath, B., Garvin, H., **Gogola, N.**, Brown, S., Reffner, J., DeForest, P., ... Whitley, A. (2021, March). *Soil Mineral Analysis by Particle Correlated Raman Spectroscopy (PCRS): Method Optimization*. Oral presentation at the Pittcon Conference and Expo. Online.
- 4. **Gogola, N.**, Valentin, P. (2021, February). *The Roles of Projectile Energy and Apparel Fabric Damage in Assessing the Magnitude of Long-Range Shooter Distances*. Poster presented at the meeting of American Academy of Forensic Sciences. Online.
- 5. **Gogola, N.**, Garvin, H., Brown, S., Maxwell, V., Reffner, J., DeForest, P., ... Kammrath, B. (2021, February). *The Effects of Sample Preparation Optimization on Soil Mineral Analysis by Particle-Correlated Raman Spectroscopy (PCRS)*. Poster presented at the meeting of American Academy of Forensic Sciences. Online.
- 6. Garvin, H., **Gogola, N.**, Brown, S., Maxwell, V., Reffner, J., DeForest, P., ... Kammrath, B. (2021, February). *Soil Mineral Analysis by Particle Correlated Raman Spectroscopy (PCRS): Method Optimization*. Oral presentation at the meeting of American Academy of Forensic Sciences. Online.
- 7. Kammrath, B., Garvin, H., **Gogola, N.**, Brown, S., Reffner, J., DeForest, P., ... Whitley, A. (2021, January). *Optimizing Particle-Correlated Raman Spectroscopy Methods for Forensic Soil Mineral Analysis*. Oral presentation at the meeting of Photonics Spectra. Online.
- 8. Garvin, H., **Gogola, N.**, Brown, S., Maxwell, V., Reffner, J., DeForest, P., ... Kammrath, B. (2020, November). *Soil Mineral Analysis by Particle Correlated Raman Spectroscopy (PCRS): Method Optimization*. Poster presented at the meeting of Eastern Analytical Symposium. Online.
- 9. Garvin, H., **Gogola, N.**, Brown, S., Maxwell, V., Reffner, J., DeForest, P., ... Kammrath, B. (2020, October). *Soil Mineral Analysis by Particle Correlated Raman Spectroscopy (PCRS): Method Optimization*. Oral presentation at the meeting of Northeastern Association of Forensic Scientists. Online.
- 10. **Gogola, N.**, Bakaul, S. (2019, April). *Effects of High Temperature Annealing on the Dielectric Properties of Hafnium Oxide*. Poster presented at the SULI Intern Poster Presentation, Argonne National Laboratory, Lemont, IL.