Kory Schimmelpfennig

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Professional Objective

Biomedical and Chemical Engineering doctoral candidate with expertise in biomedical materials science and polymer physics seeking a position at a research institute. Pragmatic approach to tackling continuous improvement research projects and accomplishing goals.

Research Interests

Materials science and characterization, self-healing polymers, additive manufacturing, energetics.

Education

Rochester Institute of Technology

Doctor of Philosophy

Biomedical and Chemical Engineering (CGPA: 3.86/4.0) — *Expected Aug. 2025*

Dissertation title: Structure/Property/Processing of Covalent Adaptable Networks bearing Hindered Urea Bonds. Research primarily focused on the preparation of poly(urea-urethane) containing thiol-ene networks.
Advisor: Dr. Christopher L. Lewis

Master of Science

Mechanical and Manufacturing Systems Integration (CGPA: 3.76/4.0) — *Aug. 2020*

Thesis title: Hydroxyl Surface Functionalization of Thin-film Yttrium for Applications with Reactive Materials. Graduated Magna Cum Laude with MS/BS dual degree.
Advisors: Dr. Mark Olles & Dr. Christopher L. Lewis

Bachelor of Science

Mechanical Engineering Technology (CGPA: 3.7/4.0) — *Aug. 2020*

This degree focused on a project oriented, hands-on approach to tackling engineering challenges. Minor in applied mathematics.

Work Experience

Rochester Institute of Technology — *May - Aug. 2019 (MS), Aug. 2019 - Present (PhD)*

Research Assistant (PhD)

- Design, synthesis, and characterization of a novel hindered urea bond (HUB) based prepolymer. Detailed study of factors such as network architecture and chain location of HUBs on healing performance and manufacturing processes.
- Investigation of polycaprolactone-based 3D printed self-healing polymer blends.
- Characterization of various alginate-gelatin-tempo mediated nano fibrillated cellulose composite formulations for extrusion-based 3D bioprinting.
- Advanced Polymers and Composites Course: developed lesson plans/assignments, conducting lab sessions and grading reports for two class sections totaling sixteen students.
- Provided technical consultation, performing data analysis and interpretation which enabled the development of a novel photosensitive foaming polymer system in collaboration with NJIT/DEVCOM-AC.

Ref: Dr. Christopher L. Lewis · +1 (585) 857 4924 · cllmet@rit.edu

Research Assistant (MS)

- Assembly of a Sintratec SLS (selective laser sintering) printer.
- Assisted, on a small team, in designing and building a custom SLA (stereolithography) printing bed / vat with temperature control loop.
- Designed and assembled a custom UV curing / filament extrusion dual-head for a Lulzbot 3D printer.
- Wrote an SOP for the Instron 4400R Universal Testing System and compression tested samples.

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Canon Virginia Inc. — *May - Aug. 2018*

CRG & IPS ME Intern

- Cartridge and Internal Parts Supply Manufacturing Engineering Intern.
- Implemented multiple quality assurance jigs to improve data collection consistency offline.
- Supported a gearbox assembly automation project from brainstorming through design selection.
- Assisted solving automation errors and performing data collection for Technical Support runs.

Ref: Tony Mosbrucker · +1 (757) 291 8575 · amosbrucker@cvi.canon.com

Learning Assistant

RIT Learning Assistant Program — *Aug. 2017 - May 2019*

- Courses included Elements of Multivariable Calculus and Differential Equations, Mechanical Dynamics with Applications, and Principles of Statics.
- Assisted lead professors in the classroom and shared knowledge across LA's of multiple disciplines.
- Participated in the Assessment Program and enrolled in a STEM Education Seminar Course.
- Utilized by a wide range of students to help give a more complete understanding of related course topics.

Ref: Deana Olles · dbcsma@rit.edu, Anthony Chirico · ajcmet@rit.edu

SUPPORTING COMPETENCIES

Dual Citizenship

American, German

Communication Skills

Summer 2019 · RIT Mathematics Institute panelist. Answered questions from local high school teachers relating to innovative pedagogical techniques.

Related Projects

Fall 2019 · CFD (ANSYS Polyflow) analysis of feed pressures that drive the extrusion process in a Hyrel System 30M printer. This controlled conference paper (JANNAF June 2021) presented a preliminary effort in the comparison of CFD to experimentally determined results and applies to guide key parameters development for FDM systems.

NASA Microgravity NExT

2017 - 2018 · Worked in a team of four on a module leak repair system capable of sealing any hole between 0.5" and 1" against atmospheric pressure. Project focus was to enable astronauts, during a spacewalk, to repair a module that had been depressurized due to an MMOD impact.

PUBLICATIONS

Peer-Reviewed Journal Articles

European Polymer Journal

K. Schimmelpfennig, V. Mei, C. L. Lewis, *Utilizing thiol-ene chemistry to explore the effect of network architecture on the properties of self-healing elastomers* (March 2025, Cover Feature) https://doi.org/10.1016/j.eurpolymj.2025.113736

Gels

R. Sarah, K. Schimmelpfennig, R. Rohauer, C. L. Lewis, S. M. Limon, A. Habib, *Characterization and Machine Learning-Driven Property Prediction of a Novel Hybrid Hydrogel Bioink Considering Extrusion-Based 3D Bioprinting* (January 2025) https://doi.org/10.3390/gels11010045

ACS Applied Polymer Materials

V. Mei, K. Schimmelpfennig, E. Caravaca, S. Colvin, C. Lewis, *Investigating the Structure-Property-Processing Relationship of Polycaprolactone-Based 3D Printed Self-healing Polymer Blends* (February 2024) https://doi.org/10.1021/acsapm.3c02628

Conference Proceedings

Fraunhofer ICT 2023

E. Caravaca, D. Bird, J. Laquidara, K. Eagan, M. Liberatore-Moretti, K. Chung, F. Berisha, C. Lewis, V. Mei, K. Schimmelpfennig, R. Nuggehalli, *Engineered Porous Propellants Using Additive Manufacturing*, 52nd International Annual Conference of the Fraunhofer ICT (2023)

JANNAF May 2023

V. Mei, K. Schimmelpfennig, E. Caravaca, C. Lewis, *Photo-rheological Characterization of Energetic Polymer*, May 2023 JANNAF Meeting

JANNAF June 2021

M. Olles, C. Denning, E. Caravaca, K. Bubniak, C. Houthuysen, C. Occhifinto, K. Schimmelpfennig, C. Lewis, L. Villasmil, *JANNAF Digital Online Collection* (ABNO 2021-0001ED, Distribution D), Proceedings of the virtual June 2021 JPM-PIB-MSS-LPS-SPS Joint Subcommittee Meeting

Poster and Conference Presentations

ACS Spring 2025

K. Schimmelpfennig, V. Mei, C. Lewis, *Effect of network architecture and material processing on the properties of self-healing polymers bearing dynamic hindered urea bonds*, Presentation – Novel Applications of Polymeric Materials

ANTEC® 2025

K. Schimmelpfennig, V. Mei, C. Lewis, *Influence of Processing Technique on Self-healing and Mechanical Behavior of Covalent Adaptable Networks Prepared via Thiol-ene Chemistry*, Presentation – Polymeric Materials and Characterization (Featured in "The Best of ANTEC® 2025")

ACS Spring 2023

K. Schimmelpfennig, C. Lewis, *Influence of Network Architecture on Self-healing and Processability of Elastomers Bearing Hindered Urea Bonds*, PMSE Poster Session & Sci-Mix

ACS Spring 2023

C. Lewis, K. Schimmelpfennig, J. La Scala, V. Mei, E. Caravaca, *3D Printing of a Dynamic Covalent Network Based on Hindered Urea Bonds*, PMSE Presentation

ACS Spring 2023

V. Mei, K. Schimmelpfennig, E. Caravaca, C. Lewis, *Structure-Property-Processing Relationship of 3D Printable Self-healing Polymer Blends*, PMSE Poster Session & Sci-Mix