DOHGYU HWANG

Midland, MI, USA | dohgyuhwang@gmail.com
dohgyuhwang.com | www.linkedin.com/in/dohgyuhwang | Google Scholar

SUMMARY

- +8 years of experience in polymer science and engineering, adhesion science.
- Project and stakeholder management across various functions and geographies.
- Innovation, development, and commercialization of new products for diverse market segments.

KNOWLEDGE, SKILLS, AND ABILITIES

- Polymer science, adhesion science, silicone science and technology.
- Formulation strategy development for advanced material solutions and product performance optimization.
- IP analysis of emerging and existing technologies and markets for value growth.
- Mechanical characterization of adhesives, coatings, and elastomers for structure property understanding.

PROFESSIONAL EXPERIENCE

Senior Research Specialist

Dow Chemical, Midland, Michigan **2022 – present**

- Develop **silicone pressure sensitive adhesives** (PSAs) and **release coatings**.
- Provide chemists and formulators with expertise in polymer physics frameworks to design chemicals, troubleshoot product defects, and ensure effective product development and customer support.

Graduate Researcher (Advisor: Dr. Michael Bartlett)

Virginia Tech, Blacksburg, Virginia **2020 – 2022**

Iowa State University, Ames, Iowa **2016 – 2020**

- Pioneered a new technique to create **strong yet easy-to-peel metamaterial adhesives** for packaging, wearable sensors, and consumer adhesive applications. This technique is applicable to diverse standard materials, scale-up processes, precision patterning, and high throughput materials development.
- Led a product development team to transform our current adhesion technology from the laboratory to the marketplace through NSF Innovation Corps (NSF I-Corps) program.
- Developed **metamaterial-based polymeric composites** for aerial/underwater drone applications.
- Collaborated with adhesive development teams to create **conductive viscoelastic adhesives** for electronic applications and **pneumatically controlled dry membrane adhesives** for robotic packaging applications.

EDUCATION

Ph.D. in Macromolecular Science and Engineering | Virginia Tech **2022**

M.S. in Materials Science and Engineering | Iowa State University **2020**

B.S. in Organic Materials Science and Engineering | Pusan National University **2016**

HONORS AND AWARDS

- Distinguished Paper Award – Adhesion Society **2022**
- Peebles Award for Graduate Student Research – Adhesion Society **2021**
- 1st Place Poster Presentation Award – National Graduate Research Polymer Conference **2021**
- Brown Graduate Fellowship – Iowa State University **2020 - 2021**
- Research Excellence Award – Iowa State University **2020**
- Dr. Karl A. Gschneidner "Go for the Gold" Student Research Prize – Iowa State University **2020**
- Best Poster Presentation Award – Nano@IAState **2019**
- Student Best Poster Award – Pressure Sensitive Tape Council (PSTC) **2018**

SELECTED PUBLICATIONS AND PATENTS

Peer-Reviewed

18 Peer-reviewed publications to date (* equal contribution)

- **D. Hwang**, C. Lee, X. Yang, J. M. P-Gonzalez, J. Finnegan, B. Lee, E. J. Markvicka, R. Long, M. D. Bartlett, Metamaterial adhesives for programmable adhesion through reversible crack propagation. *Nature Materials*, **2023**, 22, 1030-1038.
- A. B. M. Tahidul Haque*, D. Ho*, **D. Hwang***, C. Lee, M. D. Bartlett, Electrically Conductive Liquid Metal Composite Adhesive for Reversible Bonding of Soft Electronics. *Advanced Functional Materials*, **2023**, 2304101.
- **D. Hwang***, E. J. Barron III*, A. B. M. Tahidul Haque, M. D. Bartlett. Shape Morphing Mechanical Metamaterials through Reversible Plasticity. *Science Robotics*, **2022**, 7(63), eabg2171.
- T. A. Pozarycki*, **D. Hwang***, E. J. Barron III*, B. T. Wilcox, R. Tutika, M. D. Bartlett. Tough Bonding of Liquid Metal-Elastomer Composites for Multifunctional Adhesives. *Small*, **2022**, 2203700.
- R. H. Plaut, **D. Hwang**, C. Lee, M. D. Bartlett, D. A. Dillard, Peeling of finite-length elastica on Winkler foundation until complete detachment. *International Journal of Solids and Structures*, **2022**, 111944.
- C. Haverkamp*, **D. Hwang***, C. Lee, M. D. Bartlett. Deterministic control of adhesive crack propagation through jamming based switchable adhesives. *Soft Matter*, **2021**, 17, 1731-1737.
- **D. Hwang**, K. Trent, M. D. Bartlett, Kirigami-Inspired Structures for Smart Adhesion. *ACS Applied Materials & Interfaces*, **2018**, 10(7), 6747-6754.
- **D. Hwang**, M. D. Bartlett. Tunable Mechanical Metamaterials through Hybrid Kirigami Structures. *Scientific Reports*, **2018**, 8(1), 3378.

Patents

- US Patent 11,904,585, Programmable adhesion using nonlinear kirigami structures.
- US Patent 20240157671, Programmable adhesion using nonlinear kirigami structures.

SELECTED PRESENTATIONS

Presented at over 10 conferences and seminars

- **D. Hwang,** Dow's R&D Capabilities and Sustainability Efforts. Pusan National University, Pusan, South Korea. 2022.
- **D. Hwang,** M. D. Bartlett. Kirigami Structures for Programmable Adhesion. Adhesion Society, San Diego, CA, USA. 2022.
- **D. Hwang**, M. D. Bartlett. Kirigami-Inspired Materials for Adhesion Control. Science of Adhesion Gordon Research Seminar (GRS), Mount Holyoke College, South Hadley, Massachusetts, USA. 2019.
- **D. Hwang**, M. D. Bartlett. Tunable Kirigami Metamaterials for Films and Adhesives. 3M Non-Tenured Faculty Award (NTFA) event, Maplewood, MN, USA. 2019 (Poster Presentation).
- **D. Hwang**, M. D. Bartlett. Tunable Kirigami Metamaterials for Films and Adhesives. Pressure Sensitive Tape Council (PSTC), Minneapolis, MN, USA. 2018 (Poster Presentation).

LEADERSHIP EXPERIENCE

- Co-chair, Gordon Research Seminar (GRS) on Science of Adhesion **2019 - 2023**
- Organization member, Session chair, National Graduate Research Polymer Conference **2021**
- Co-session chair, PSAs and Viscoelasticity, Adhesion Society **2021**
- Entrepreneurial Lead, NSF Innovation Corps (NSF I-Corps), Iowa State University **2020**
- Senator, Materials Science and Engineering, Iowa State University **2020**
- Founding member, Director, Student Advocacy Committee, International Student Council **2019**
- Founder, Instructor, Korean Language Class, Iowa State University **2018 – 2020**
- Team helper, FIRST LEGO League **2019**
- Judge, Iowa State Science and Technology Fair **2017**