Jolina J. Karam, PhD

Postdoctoral Researcher and President of Aerogel Coating Technologies Inc.

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CURRENT EMPLOYMENT

Pavement Staff Engineer II

Nichols Consulting Engineers Chtd.

May 2024 – Present | Scottsdale, Arizona

Postdoctoral Researcher

Arizona State University

May 2024 – Present | Tempe, Arizona

President

Aerogel Coating Technologies Inc. (aCT)

May 2024 – Present | Tempe, Arizona

EDUCATION

PhD. in Civil, Environmental and Sustainable Engineering

Arizona State University

August 2020 – May 2024 | Tempe, Arizona

- GPA 4.00
- Researching innovative methods to modify asphalt crack sealants to improve their durability and performance
- Applying and understanding standards and test specifications
- Evaluating cool pavement products and surface treatments application
- Developing innovative products and incorporating them into asphalt mixtures and binders
- Conducting Pavement Distress Surveys and recommending maintenance and rehabilitation techniques
- Developing and validating a thermal expansion and contraction test for bituminous materials

M.S. in Civil, Environmental and Sustainable Engineering

Arizona State University

August 2018 – May 2020 | Tempe, Arizona

- GPA: 4.00
- Developing an assessment tool for asphalt mixtures evaluating permanent deformation, rutting and thermal cracking potential
- Researching the effect of climate on Flow Number, rutting depth and fatigue cracking using the LTPP Database
- Analyzing predictive models for rutting, fatigue and thermal cracking with regards to climatic conditions
- Developing innovative products and incorporating them into asphalt mixtures and binders

B.E. in Civil and Environmental Engineering | Minor in Engineering Management

Notre Dame University, Beirut

August 2013 – May 2018 | Zouk Mosbeh, Lebanon

- GPA: 3.33
- Evaluating the use of Light Gauge Steel in Buildings in Lebanon

AWARDS/SCHOLARSHIPS

- **Helene M. Overly Memorial Scholarship**
  WTS International, 2024
- **Helene M. Overly Memorial Scholarship**
  WTS Phoenix Metropolitan, 2024
- **1st Place Poster Competition Winner**
  14th Annual SSEBE Graduate Symposium, 2024
- **Global Road Achievement Award Winner for Research**
  International Road Federation, 2023
- **Fulton Graduate Fellowship**
  Ira E. Fulton, School of Engineering, 2019 and 2020
- **2nd Place Poster Competition Winner**
  Arizona Pavement Conference, 2019
- **Dr. Matthew W. Witczak Graduate Fellowship**
  Arizona Pavement Conference, 2019

AFFILIATIONS/MEMBERSHIPS

- **ASHE Student Chapter Treasurer**
  ASU, January 2023- May 2024
- **Engineer In Training (EIT)**
  January 2023
- **International Road Federation (IRF) Fellow**
  January 2020
- **ASCE Student Chapter President**
  NDU, August 2016 – August 2017
- **ASCE Student Member (Member ID: 000011948233)**
  August 2014 – Present

SOFTWARE SKILLS

- Microsoft Office:
  Word | Excel | PowerPoint | Publisher
- Road/Pavement Design and Analysis:
  AASHTOWare Pavement ME | MicroStation | OpenRoads
- Structural Analysis and Modeling:
  AutoCAD | Robot Structural Analysis
- Other:
  Origin Pro | ImageJ | SPSS

PROFESSIONAL EXPERIENCE

Pavement Staff Engineer II

Nichols Consulting Engineers Chtd.

May 2024 – Present Scottsdale, Arizona

- Conducting Pavement Management Analyses.
- Performing field exploration, inspection, analysis; provides technical support
- Performing field testing, preparing maps, and interpreting field and test results
- Approving subcontractor and equipment/materials supplier invoices; completing project expense records
- Contacting vendors; researching literature and regulatory requirements under supervision; preparing draft designs and performing routine design calculations

Postdoctoral Researcher

Arizona State University

May 2024 – Present Tempe, Arizona

- Developing new asphalt mixtures and binders modifiers to improve thermal susceptibility, flexibility and performance including aerogel, recycled additives, crumb rubber and fibers.
- Mentoring research scientists and PhD students to pursue their careers

President, Aerogel Coating Technologies (aCT)

New Start-up Venture

August 2022 – Present Tempe, Arizona

- Testing different Aerogel qualities and sources for optimum performance in asphalt binders according to material standards
- Define quality control products, mixture design parameters and contents

Graduate Research and Teaching Associate

Arizona State University

August 2018 – May 2024 Tempe, Arizona

- Teaching Assistant and Lab Instructor for Civil Engineering Materials, Highway Geometric Design, Bituminous Materials courses (CEE 353, CEE 475, CEE 514).
- Researching the effect of cool pavement products and surface treatments with regards to Urban Heat Island Effects
- Developing thermal properties testing protocol and methods
- Testing a variety of modifiers into asphalt binders and mixtures, such as crumb rubber, fibers, and other fillers

Research Assistant, IAESTE Intern

University of Technology, Vienna (TU Wien)

May 2019 – July 2019 Vienna, Austria

- Studying of the binder micro-structure, chemistry, and its behavior with short/long term oxidative ageing
- Identifying asphalt binder fractioning using FAST SARA Testing
- Analyzing asphalt binder chemical signatures using Fourier Transform Spectroscopy (FTIR)

LABORATORY EXPERIENCE

- Asphalt Binder Testing
- Asphalt Mixture Testing
- Soil and Aggregate Testing
- Fresh and Hardened Portland Cement Concrete Testing

LANGUAGES

Arabic | French | English

REFERENCES

Kamil E. Kaloush, PhD, P.E.
@ kaloush@asu.edu
Arizona State University

Michael S. Mamlouk, PhD, P.E.
@ mamlouk@asu.edu
Arizona State University

Hasan Ozer, PhD
@ hasan.ozer@asu.edu
Arizona State University

Jose R. Medina, PhD, P.E.
@ jrmedina@asu.edu
Arizona State University

Civil Engineering Intern

E.R.G.A. Group, Majid Al-Futtaim

June 2016 – August 2016 Dbayeh, Lebanon

- Inspecting structural elements, post-tension jacking, cable distribution and finishing techniques for buildings
- Reading construction layouts and performing Bill of Quantities
- Performing Portland Cement Concrete field testing (slump test, air void contents etc.)

VOLUNTEERING EXPERIENCE

- CPR and First Aid Instructor Assistant *(August 2022 – Present)*
- Arizona Pavement Conference Student Volunteer *(November 2018 – November 2023)*
- International Road Federation Annual Meeting Student Volunteer *(November 2021)*

PUBLICATIONS AND PROCEEDINGS

Patents

- [Provisional Patent] Jolina Karam and Kamil Kaloush (2024). *M24-267P: Test Method for Measuring Thermal Expansion and Contraction Coefficient for Polymer and Viscoelastic Materials*. Application filed in the United States Patent and Trademark Office, Serial Number: 63/641760.
- [Pending] Carlos J. Obando, Jolina Karam, and Kamil Kaloush (2022) (2023). *M21-205P: Aerogel Modified Bituminous Binders and Mixtures (aMBx)*. Application filed in the United States Patent and Trademark Office, Serial Number: 63/210891.
- [Pending] Carlos J. Obando, Jolina Karam, Jose R. Medina and Kamil Kaloush (2022) (2023). *M23-122P: Recycled Aerogel Composite for Construction Materials (RaC)*. Application filed in the United States Patent and Trademark Office, Serial Number: 63/485183.

Conference Proceedings

- Jolina Karam, Portia Lartey, Mohammed Alhozaimy, Jose R. Medina, Ryan Stevens and Kamil E. Kaloush (2024). "Understanding Thermal and Mechanical Properties of Cool Pavement Coatings for Urban Heat Island Mitigation". In: *2024 Transportation Research Board Annual Conference*.
- Carlos J. Obando, Jolina Karam, Samuel Castro, Jose R. Medina and Kamil E. Kaloush (2023). "Portrayal and Durability Assessment of Novel Silica-Based Modified Asphalt Pavements". In: *2023 Transportation Research Board Annual Conference*.
- Jolina Karam, Ramadan Salim and Kamil E. Kaloush (2021). "Using Mixture Design Data and Existing Prediction Models to Evaluate the Potential Performance of Asphalt Pavements". In: *2021 Transportation Research Board Annual Conference*.

Journal Publications

- Jolina Karam, Ali Zalghout, Abdel Rahman El Tallis, Kamil E. Kaloush (2024). "Improving the Properties of Hot Applied Crack Sealant by Utilizing Pre-activated Crumb Rubber (PCR)". in: *Construction and Building Materials, Elsevier*.
- Sand Aldagari, Jolina Karam, Mohammadjavad Kazemi, Kamil Kaloush, Elham H Fini (2024). "Comparing the Critical Aging Point of Rubber-Modified Bitumen and Plastic-Modified Bitumen". In: *Journal of Cleaner Production, Elsevier* 47, p. 140540.
- Carlos J. Obando Jolina Karam, Jose R. Medina and Kamil E. Kaloush (2023). "Thermal Properties of Asphalt Pavements Modified with a Lightweight Silica-Based Composite". In: *Journal of Materials in Civil Engineering, ASCE*.
- Carlos J. Obando, Jolina Karam and Kamil E. Kaloush (2023). "Characterization and Assessment of Aerogel-Modified Asphalt Binders". In: *International Journal of Pavement Engineering, Taylor and Francis*.
- Jolina Karam and Hossein Noorvand (2023). "Developing a Rutting Prediction Model for HMA Pavements using the LTPP Database". In: *International Journal of Pavement Research and Technology, Springer*.
- Ali Zalghout, Samuel Castro, Jolina Karam and Kamil E. Kaloush (2022). "Laboratory and field evaluation of plant produced asphalt mixtures containing RAP in hot climate: A case study from Phoenix, Arizona". In: *Construction and Building Materials, Elsevier* 351, pp. 128–322.
- Jolina Karam, Ramadan Salim and Kamil E. Kaloush (2022). "Using Mixture Design Data and Existing Prediction Models to Evaluate the Potential Performance of Asphalt Pavements". In: *Journal of Materials in Civil Engineering, ASCE* 34.7, p. 04022151.