

THOMAS GERNAY

Associate Professor



Professional Summary

Gernay is an Associate Professor with 15 years of experience in structural fire engineering. At JHU he founded and lead the Multi-Hazard Resilient Structures Group. His research advances resilience of the built environment by developing models for the behavior of materials and structures under extreme conditions, developing numerical analysis and fire design methods, and defining risk-based and performance-based approaches for structures subjected to fire. He is the co-developer of SAFIR, a software for modeling the behavior of building structures in fire licensed by 300+ academic institutions and design consultancy offices worldwide. His research has been funded by the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST), nonprofit organizations, and industry. His awards include the NSF CAREER award, the AISC Terry Peshia Early Career Faculty Award, the NFPA Foundation Medal, the IAFSS Magnusson Early Career Award, and the ASCE Maryland Outstanding Educator of the Year Award. He is also a Fulbright Fellow.

Gernay serves in several professional associations to advance fire safety and building codes, including as the Co-Chair of the Fire Protection Committee of the American Society of Civil Engineers (ASCE) Structural Engineering Institute (SEI); a Voting Member on the American Concrete Institute (ACI) Fire Resistance and Fire Protection Committee (ACI-216); and a member of the American Institute of Steel Construction (AISC) Task Committee 8 (TC8: Design for Fire Conditions). He is also the Chair of the Scientific Committee of the Structures in Fire (SiF) conference series, and an Associate Editor for both Fire Technology and the ASCE Journal of Structural Engineering.

Appointments

- 2025 - present **Associate Professor**, Johns Hopkins University, Department of Civil and Systems Engineering, Baltimore, Maryland, United States
- 2018 - 2025 **Assistant Professor**, Johns Hopkins University, Department of Civil and Systems Engineering, Baltimore, Maryland, United States
- 2015 - 2017 **Postdoctoral Researcher**, University of Liege, Belgium
- 2014 - 2015 **Fulbright Postdoctoral Researcher**, Princeton University, Department of Civil and Environmental Engineering, New Jersey, United States
- 2013 - 2014 **Project Engineer**, Cockerill Maintenance Ingenierie, Seraing, Belgium
- 2010 - 2011 **Visiting Scholar**, Atomic Energy Commission (CEA), Saclay, France

Professional Preparation

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| PhD/2012 | University of Liege, Belgium | PhD in Structural Engineering |
| MENG/2009 | University of Liege, Belgium | Master in Civil Engineering |
| BENG/2007 | University of Liege, Belgium | Bachelor in Engineering Sciences |

Selected Publications

95 articles in peer-reviewed scientific journals and 100 articles in conference proceedings
h-index 37 and 4600 citations on [Google Scholar](#)

1. Niu Y, Emberley R, Hutchinson T, Schafer B, Meacham B, Gernay T. (2026). "Thermal modeling of post-earthquake fire tests on a 10-story cold-formed steel building". *Fire Safety Journal*, 162, 104773.
2. Gernay T, Ma C, Renard S, Franssen JM, Zehfuss J, McNamee R, Bamonte P, Robert F. (2026). "Testing timber columns for resistance until fire burnout: Role of thermal wave, smoldering, and active suppression". *Engineering Structures*, 351, 121991.

3. Xie J, Niu Y, Gernay T. (2025). "Experiments on local buckling of cold-formed steel lipped channels in compression at elevated temperatures". *Engineering Structures*, 338, 120594.
4. Ma C, Gernay T. (2025). "Fragility curves for structural fire performance of various composite floor designs under natural fire". *Reliability Engineering & System Safety*, 257, 110820.
5. Gernay T. (2024). "Performance-based design for structures in fire: Advances, challenges, and perspectives". *Fire Safety Journal*, 142, 104036
6. Gernay T, Zehfuss J, Brunkhorst S, Robert F, Bamonte P, McNamee R, Mohaine S, Franssen JM. (2023). "Experimental investigation of structural failure during the cooling phase of a fire: Timber columns". *Fire and Materials*, 47(4), 445-460.
7. Gernay T. (2021). "Fire resistance and burnout resistance of timber columns". *Fire Safety Journal*, 122, 103350.
8. Yan X., Gernay T. (2021). "Numerical modeling of localized fire exposures on structures using FDS-FEM and simple models". *Engineering Structures*, 246, 112997.
9. Gernay T., Elhami Khorasani N. (2020). "Recommendations for performance-based fire design of composite steel buildings using computational analysis". *Journal of Constructional Steel Research*, 166, 105906.
10. Franssen J.-M., Gernay T. (2017). "Modeling structures in fire with SAFIR®: Theoretical background and capabilities". *Journal of Structural Fire Engineering*, 8(3), 300-323.

Synergistic Activities

1. Co-inventor of the software SAFIR. SAFIR is a non-linear finite element program for analyzing the behavior of structures subjected to fire. I also delivered training courses on SAFIR to academics and structural engineers in Europe and in the USA.
2. Participation in national standards development efforts: I was one of the lead authors of the first Appendix for Fire Design in the Specification ANSI/SDI AISI S100-2024 (2019-2022): *North American Specification for the Design of Cold-Formed Steel Structural Members*.
3. Innovations in teaching and knowledge transfer to professionals: I developed and teach a fully online, asynchronous version of my "Structural Fire Engineering" course for the "Engineering for Professionals" degree program at the JHU Whiting School of Engineering.
4. Co-Chair of the ASCE Structural Engineering Institute (SEI) Fire Protection Committee. I co-lead the committee, including setting strategic priorities, facilitating meetings, and managing the committee's activities. The committee currently has three active subcommittees.
5. Associate Editor of the peer-reviewed journals *Fire Technology* and *ASCE Journal of Structural Engineering*.

Selected Awards

Johns Hopkins University Catalyst Award (2026)
 ASCE Maryland Section Outstanding Educator of the Year Award (2025)
 NSF CAREER Award (2023)
 AISC Early Career Terry Peshia Faculty Award (2023)
 IAFSS Magnusson Early Career Award (2023)
 Foundation Medal, NFPA Fire Protection Research Foundation (2019)
 IAFSS Best Thesis Award 'Excellence in Research' (2014)
 Fulbright Commission, 1-year postdoctoral fellowship (2014)
 McKinsey & Company Scientific Award (2013)