

2016 STUDENTS

Gabriel MERIC DE BELLEFON

Current affiliation:

University of Wisconsin – Madison

Contact information:

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Education:

PhD Candidate in Nuclear Engineering, University of Wisconsin – Madison, WI, USA (2014 – Present)

M.S. in Nuclear Engineering, University of California at Berkeley, CA, USA (2008 – 2009)

B.S./M.S. in Engineering, École Polytechnique, France (2005 – 2008)

Thesis Title(s):

Tailoring plasticity of stainless steel for nuclear applications

Brief description of work experience

Worked 4 years as researcher at EPRI, Electricite de France. Worked as consultant to energy start-ups in the US. Now PhD candidate in nuclear materials.

Topics of research interest:

Nuclear materials, in particular austenitic stainless steel

Selected publications:

Meric de Bellefon, G., and J. C. van Duysen. "Tailoring plasticity of austenitic stainless steels for nuclear applications: Review of mechanisms controlling plasticity of austenitic steels below 400° C." *Journal of Nuclear Materials* 475 (2016): 168-191.



G. Meric de Bellefon, C. Domain, J.C. van Duysen, K. Sridharan, *Proc. ICAPP* (2016). San Francisco, CA.

Meric De Bellefon, G., and B. D. Wirth. 2011. "Kinetic Monte Carlo (KMC) Simulation of Fission Product Silver Transport through TRISO Fuel Particle." *Journal of Nuclear Materials* 413(2): 122–31. <http://dx.doi.org/10.1016/j.jnucmat.2011.04.010>.

Current research project and /or engineering activity:

My research focuses on providing improvements to current 304(L) and 316(L) stainless steels by tailoring their plasticity based on the needs of the application. For instance, I attempt to increase their fracture toughness or SCC resistance by promoting twinning- or slip-based plasticity at crack tip. I also look at reducing IASCC initiation rate by promoting twin or martensite volume fraction in surface layers. Such plasticity tailoring can be obtained from adjustments to chemical composition, grain size, texture, cold-working treatment, and machining conditions, while staying within the AISI specification ranges.

Project challenges:

Finding or generating reliable experimental data. Decoupling one variable (e.g., composition) from all other variables (grain size, sample geometry, etc.). Capitalize acquired knowledge/data into a useful format/deliverable for the industry.