



Exponent[®]
Engineering & Scientific Consulting

Etienne Demarly, Ph.D.

Associate | Thermal Sciences
149 Commonwealth Drive | Menlo Park, CA 94025
(650) 688-7317 tel | edemarly@exponent.com

Professional Profile

Dr. Demarly's expertise is in Computational Fluid Dynamics (CFD), heat transfer, and multiphase flow. Applications of his experience include evaluating vapor generation inside steam generators, estimating conjugate heat transfer (solid/fluid) of a heating surface, simulating chemical tracer mixing in industrial equipment as well as conducting large scale LES and URANS CFD simulation of nuclear fuel assemblies. He also has experience in numerical modeling, statistics and data visualization.

Before joining Exponent, Dr. Demarly worked as a PhD candidate in the Nuclear Science and Engineering department at the Massachusetts Institute of Technology (MIT). His research focused on the mechanistic modeling and prediction of the boiling crisis phenomenon known as Departure from Nucleate Boiling (DNB) – a longstanding challenge in the nuclear industry. During the development and validation of his model, Dr. Demarly deployed image processing techniques, statistical data post-treatment, numerical methods and CFD simulations to accurately represent boiling physics in the highly complex nucleate boiling regime up to the Critical Heat Flux (CHF). He also conducted multiple large scale CFD simulations of steam generators (both single phase and multi-phase).

Academic Credentials & Professional Honors

Ph.D., Nuclear Science and Engineering, Massachusetts Institute of Technology (MIT), 2020

M.S., Nuclear Engineering (Diplôme d'ingénieur spécialisé en Génie atomique), INSTN-CEA (France), 2013

Engineer, Electrical Engineering, Supélec (France), 2012

Professional Affiliations

American Nuclear Society (ANS)

American Society of Mechanical Engineer (ASME)

Publications

Baglietto, E., Demarly, E., Kommajosyula R., "Boiling crisis as the stability limit to wall heat partitioning", Applied Physics Letters, Volume 114, 2019, doi:10.1063/1.5080724

Baglietto, E., Demarly, E., Kommajosyula R., Lubchenko, N., Magolan, B., Sugrue, R., "A Second Generation Multiphase-CFD Framework Toward Predictive Modeling of DNB", Nuclear Technology,

Volume 205, 2019, doi:10.1080/00295450.2018.1517528

Richenderfer, A., Kossolapov, A., Seong, J.H., Saccone, G., Demarly, E., Kommajosyula, R., Baglietto, E., Buongiorno, J., Bucci, M., "Investigation of subcooled flow boiling and CHF using high-resolution diagnostics", *Experimental Thermal and Fluid Science*, Volume 99, December 2018, Pages 35-58, doi:10.1016/j.expthermflusci.2018.07.017

Baglietto, E., Demarly, E., Kommajosyula, R., "Predicting Critical Heat Flux With Multiphase CFD: 4 Years in the Making", *ASME. Fluids Engineering Division Summer Meeting*, Volume 1C, 2017, doi:10.1115/FEDSM2017-69242

Moudakir, T., Abid, M., Doan, B.-T., Demarly, E., Gautier, S., Orsa, G., Jacquet, J., Ougazzaden, A., Genty, F., "Asymmetrical Design of AlGaIn/GaN Distributed Bragg Reflectors for Near-UV Optoelectronic Applications", *Advanced Science Letters*, Volume 16, Number 1, September 2012, pages 100-104, doi:10.1166/asl.2012.3295

Presentations

Demarly, E., Baglietto, E., The 10th International Conference on Boiling & Condensation Heat Transfer (ICBCHT18), Nagasaki, Japan, March 2018, "Toward a first principle DNB detection model for applications in CFD"

Demarly, E., Baglietto, E., 70th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Denver, CO, November 2017, "A New Approach for Departure from Nucleate Boiling modelization"

Demarly, E., Baglietto, E., 5th International Education Forum on Environment and Energy Science (ACEEES16), San Diego, CA, December 2016, "Development of a new DNB model in CFD for nuclear applications"