

## Juliana Pacheco Duarte

*Assistant Professor, Nuclear Engineering Program, Virginia Tech  
427 Goodwin Hall, 625 Prices Fork Road, Blacksburg, VA 24061*

### CURRENT POSITION

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Aug. 2018 – present      **Assistant Professor**  
Nuclear Engineering Program  
Mechanical Engineering Department  
Virginia Polytechnic Institute and State University

### EDUCATION

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2018      **Ph.D., Nuclear Engineering and Engineering Physics**  
University of Wisconsin-Madison, U.S.A.  
*Dissertation:* “Understanding the Minimum Film Boiling Temperature in Two-Phase Flow”  
Advisor: Michael L. Corradini

2014      **M.Sc., Electrical Engineering**  
University of São Paulo (USP), Brazil  
*Thesis:* “A design of experiments for evaluating the critical heat flux of small-scale pressurized water reactors”  
Advisor: Jose Roberto C. Piqueira

2016      **B.Sc., Physics**  
State University of Campinas (UNICAMP), Brazil  
*Thesis:* “Interaction of neutrons produced in extensive showers with the soil.”  
Advisor: Jose Augusto Chinellato

2013      **B.Sc., Nuclear Engineering**  
Federal University of Rio de Janeiro (UFRJ), Brazil  
*Thesis:* “Atmospheric Dispersion of Radionuclides and Dose Calculation due to Low and Intermediate Radiation Level Package Drop”  
Advisor: Paulo Fernando F. Frutuoso e Melo

### PREVIOUS POSITIONS

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Aug. 2014 – Jun. 2018      **Graduate Researcher** – CAPES Science without Borders Ph.D. Fellowship  
NEEP571 grader, Economic & Env. Aspects of Nuclear Power (spring/2016)  
NEEP411 grader, Nuclear Reactor Eng. (Fall/2015 and Fall/2016)  
Eng. Physics Department – University of Wisconsin-Madison

Feb. 2013 – Nov. 2014      **Associate Researcher**  
Project: Critical Heat Flux experiment specifications, test section basic and detailed design, data acquisition analysis and correlations for a small Pressurized Water Reactor (PWR) (up to 50 MWt)  
P.I.: Jose Roberto C. Piqueira – Process N. FAPESP 2010/11113-2  
University of São Paulo

Feb. 2013 – Aug. 2014      **Graduate Researcher**  
Project: Critical Heat Flux Experimental Analysis for Pressurized Water Reactors up to 50MWe

Navy Technological Center in São Paulo (CTMSP), Brazil

Jan. 2012 – **Intern**  
Mar. 2012 Project: Accident Analysis of a Packed Fall at the Monitoring Building Center for Waste Management at Admiral Álvaro Alberto Nuclear Power Station: Atmospheric Dispersion and Dose Calculation  
Eletrobrás Termonuclear S.A. - Rio de Janeiro, Brazil

## **FELLOWSHIPS AND AWARDS**

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Aug. 2014 – Jul. 2018 CAPES Science without Borders *Fellowship* for Ph.D. studies

Aug. 2014 – Jul. 2018 *Research support award*  
Engineering Physics Department, University of Wisconsin - Madison

Mar. 2013 – Jul. 2014 Navy Technological Center in São Paulo (CTMSP) *Fellowship*

Nov. 2014 IV OSCAR NIEMEYER *Award for Scientific and Technological Projects*  
Issuer: Regional Council of Engineering and Agronomy of Rio de Janeiro State (CREA/RJ)

Apr. 2012 – Feb. 2013 Foundation for Research Support of the State of Rio de Janeiro (FAPERJ) *Scholarship*  
Project: Comparison of some Markovian and block models with Bayesian Networks for reliability calculations (B.Sc.).  
Advisor: Paulo Fernando F. Frutuoso e Melo  
Process N. E-26/100.702/2012

Oct. 2010 – Oct. 2011 National Institute of Science and Technology of Innovative Nuclear Reactors – INCT/CNPq *Scholarship*  
Project: Improved lumped parameter formulation for simplified thermal-hydraulic analysis of nuclear reactors (B.Sc.).  
Advisors: Su Jian and Antonio Carlos M. Alvim  
Process N. 157207/2010-2

Feb. 2008 – Aug. 2008 National Council for Scientific and Technological Development (PIBIC/CNPq) *Scholarship*  
Project: Determination of hadronic interaction characteristics for localized targets (C-Jets) (B.Sc.).  
Advisor: Edison Shibuya

## **TEACHING ACTIVITIES**

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*Virginia Polytechnic Institute and State University*

### **Graduate courses**

- NSEG 5114 Nuclear Engineering Fundamentals  
Fall 2020
- NSEG 6984 Advanced Two-phase Flow  
Spring 2019
- NSEG 5974 Independent Study on Probabilistic Risk Assessment

Spring, 2020

### **Undergraduate courses**

- ME 2134 Thermodynamics  
Spring 2020
- ME 3124 Thermodynamics  
Fall 2018, Fall 2019
- ME 4016 Engineering Design and Project Course  
Spring 2019, Spring 2021
- ME 4015 Engineering Design and Project Course  
Fall 2018, Fall 2020
- ME 4994 Undergraduate Research  
Fall 2019
- NSEG 4994 Undergraduate Research  
Spring 2019 – Spring 2021

### *University of Wisconsin-Madison*

- Course Development Assistant of NEEP 411 Nuclear Reactor Engineering Course  
May 2015 – Jan. 2017

### **ADDITIONAL TEACHING ACTIVITIES**

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- Invited Talks
  - Duarte, J. P. and Lima, I, “Talking with Professors”, Nuclear Engineering Department, Federal University of Rio de Janeiro (virtual event), July 31, 2020.
  - Duarte, J. P., "Thermal Hydraulics and Safety in Advanced Nuclear Reactors", Alpha Chi Sigma, Professional Chemistry Fraternity at Virginia Tech, October 24th, 2018.

### **MENTORING ACTIVITIES**

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#### **Completed:**

- M.Sc. in Nuclear Engineering
  - Elvan Sahin, Discrete-Time Bayesian Networks Applied to Reliability of Flexible Coping Strategies of Nuclear Power Plants, 2019-2021, Virginia Tech
  - Paul Hurley, Application of Optical Fiber Sensors for Quenching Temperature Measurement, 2018-2020, Virginia Tech.
- Undergraduate research
  - Alex deJong, Major in Material Science and Engineering, 2020-2021
  - Renzhi Hu, Major in Mechanical Engineering, Spring, 2021
  - Matthew Kramer, Major in Mechanical Engineering, Spring, 2021
  - Abdulla Alblooshi, Major in Chemical Engineering, 2019-2020
  - Nick Burns, Major in Chemical Engineering, 2019-2020
  - Shubham Rath, Major in Mechanical Engineering, Fall, 2019
  - Jenny McAneney, Major in Mechanical Engineering, Fall, 2020

#### **Current:**

- Ph.D. in Nuclear Engineering
  - Elvan Şahin, 2021-
  - Paul Hurley, 2020-
  - Bruno P. Serrao, 2019-

- M.Sc. in Nuclear Engineering
  - Abdulsalam Shakhathreh, 2019-
  - Ali H. Karabacak, 2020-
  
- Undergraduate research
  - Jeric Demasana, Major in Electrical Engineering and Nanoscience, 2019-
  - Erik Sharrer, Major in Mechanical Engineering, 2020-
  - Peter Wynnyk, Major in Material Science and Engineering, 2021-
  - Evelyn Washburn, Major in Engineering, 2021-
  - Shane Carroll, Major in Ocean Engineering, 2021-

**Postdoc supervision:**

- Dr. Kyung Mo Kim, 02/2021 – present

**PEDAGOGICAL TRAINING AND ADDITIONAL EXPERIENCE**

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| Feb. 2 <sup>nd</sup> , 2019  | Listener: Large Class Symposium, The Inn Virginia Tech & Skelton Conference Center, Blacksburg, VA.                                                                       |
| Mar. 21 <sup>st</sup> , 2018 | University Health Services Suicide Prevention Training, University of Wisconsin-Madison                                                                                   |
| Apr. 24 <sup>th</sup> , 2017 | Bias training: “Breaking the Prejudice Habit: Creating Inclusion and Overcoming Bias”, University of Wisconsin-Madison                                                    |
| Fall 2016                    | Course: Teaching in Science and Engineering: The College Classroom International Delta Program in Research, Teaching and Learning at the University of Wisconsin-Madison. |
| Jan 2012 –<br>Jan 2013       | Student representative: Guidance and Academic Monitoring Committee (COAA) – Nuclear Engineering Department, Federal University of Rio de Janeiro                          |

**PUBLICATIONS**

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**Total: 2 book chapters, 14 journal papers, 24 conference papers**

**Journal Papers (under review)**

Hurley, P. and Duarte, J.P., “Implementation of Fiber Optic Temperature Sensors in Quenching Heat Transfer Analysis”, *Applied Thermal Engineering*, 2021 (accepted). (IF 2019: 4.725)

**Journal Papers (published)**

*Thermal-hydraulics and Safety*

1. Moreira, T. A., Duarte, J.P., Do Nascimento, F.J., Ribatski, G., “Flow boiling heat transfer coefficient of DI-water and nanofluids inside microscale channels under conditions near to the critical heat flux (CHF)”, *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, v. 43, 308, 2021. (IF 2019: 1.755)
2. Duarte, J. P., Yarsky, P., Zaki, T., and Corradini, M.L., “Full-Scale Dryout/Rewet Instability Tests in a BWR Rod Bundle and TRACE Assessment”, *Nuclear Engineering and Design*, v. 370, 1-11, 2020. (IF 2019: 1.620)

3. Zhao, D., Duarte, J. P., Liu, W., Corradini, M. L., Wang, J., Bi, J., “DNB Type Critical Heat Flux Prediction in Rod Bundles with Simplified Grid Spacer Based on Liquid Sublayer Dryout Model”, *Nuclear Engineering and Design*, v. 351, p. 94-105, 2019. (IF 2018: 1.541)
4. Zhang, R., Duarte, J. P., Cong, T., Corradini, M. L., “Investigation on the critical heat flux in a 2 by 2 fuel assembly under low flow rate and high pressure with a CFD methodology”, *Annals of Nuclear Energy*, v. 124, p. 69-79, 2019. (IF 2017: 1.476)
5. Jo, H., Yeom, H. Yoon, D. S., Duarte, J. P., Corradini, M. L., “Minimum heat flux (MHF) behavior with different surface characteristics including structured surfaces and different surface energies”, *International Journal of Heat and Mass Transfer*, v. 127, p. 414-421, 2018. (IF 2017: 3.891)
6. Duarte, J. P., Zhao, D., Jo, H., Corradini, M. L., “Critical Heat Flux Experiments and a Post-CHF Heat Transfer Analysis using 2D Inverse Heat Transfer”, *Nuclear Engineering and Design*, v. 337, p. 17-26, 2018. (IF 2017: 1.190)
7. Greenwood, M. S., Duarte, J. P., Corradini, M., “Presentation and comparison of experimental critical heat flux data at conditions prototypical of light water small modular reactors”. *Nuclear Engineering and Design*, v. 317, p. 220-231, 2017. (IF 2017: 1.190)
8. Dong, X., Duarte, J. P., Zhang, Z., Corradini, M. L., Tian, Z., Chen, G., “Numerical investigation of single-phase heat transfer in a 2×2 rod bundle with spacer grids for a High-Pressure Heat Transfer Facility”. *Nuclear Technology*, v. 199, p. 174-186, 2017. (IF 2017: 0.786)
9. Duarte, J. P., Rivero Oliva, J. J., Frutuoso e Melo, P. F., Alvim, A. C. M., “Coupling of a Lumped Parameter and a Finite Difference Model for Estimation of a Reactivity Induced Transient in a PWR with Annular Fuel Rods”, *Nuclear Technology*, v. 185, p. 109-126, 2014. (IF 2017: 0.786)

#### Probabilistic Risk Assessment

10. Ribeiro, A. C. O., Sousa, A. L., Duarte, J. P., Frutuoso e Melo, P. F. F., “Human Reliability Analysis of the Tokai-Mura Accident Through a THERP-CREAM and Expert Opinion Auditing Approach”, *Safety Science*, v. 87, p. 269-279, 2016. (IF 2017: 2.835)
11. Gomes, E. C., Duarte, J. P., Frutuoso e Melo, P. F., “Human Reliability Modeling of Radiotherapy Procedures by Bayesian Networks and Expert Opinion Elicitation”, *Nuclear Technology*, v. 194, p. 73-96, 2016. (IF 2017: 0.786)
12. Gomes, E. C., Duarte, J. P., Frutuoso e Melo, P. F., “Human reliability analysis of radiotherapy procedures using Bayesian networks”, *Chemical Engineering Transactions*, v.33, pp. 427-432, DOI: 10.3303/CET1333072, 2013. (SJR 2017: 0.293)
13. Duarte, J. P., Frutuoso e Melo, P. F., Alves, A. S. M., Passos, E. M., “Atmospheric dispersion and dose evaluation due to the fall of a radioactive package at a LILW facility”, *International Journal of Energy Engineering*, v.3, pp.119-126, DOI: 10.5923/j.ijee.20130303.01, 2013.
14. Sousa, A. L., Frutuoso e Melo, P. F., Duarte, J. P., Ribeiro, A. C. O., “On the Impact of Human and Organizational Archetypes on Human Failure Probabilities Used in Risk Analyses”, *Chemical Engineering Transactions*, v.31, pp. 409-414, DOI: 10.3303/CET1331069, 2013. (SJR 2017: 0.293)

#### **Technical Notes**

1. Dong, X., Duarte, J. P., Liu, D., Wang, J., Zhang, Z., Tian, Z., “Numerical investigation of azimuthal heat conduction effects on CHF phenomenon in rod bundle channel”, Technical Note, *Annals of Nuclear Energy*, v. 121, p. 203-209, 2018. (IF 2017: 1.476)
2. Duarte, J. P., Corradini, M. L., “Hydraulic and heated equivalent diameters used in heat transfer correlations”. Technical Note, *Nuclear Technology*, v. 201(1), p. 99-102, 2018. (IF 2017: 0.786)

## Book chapters

1. Duarte, J. P., Rivero Oliva, J. J., Frutuoso e Melo, P. F., *Generation IV Nuclear Systems: State of the Art and Current Trends with Emphasis on Safety and Security Features*. In: Amir Zacarias Mesquita (Editor), *Current Research in Nuclear Reactor Technology in Brazil and Worldwide*. 1<sup>st</sup> ed. Rijeka: InTech, ISBN: 978-953-51-0967-9, DOI: 10.5772/53140, pp. 143-174, 2013.
2. Sousa, A. L., Duarte, J. P., Saldanha, P. L. C., Frutuoso e Melo, P. F., *The Role of Risk-informed Decision Making in the Licensing of Nuclear Power Plants*. In: Zhiyong Zhang (Editor), *Risk Assessment and Management*. 1 ed. Academy Publish, ISBN: 978-0-9835850-0-8, p. 177-192, 2012.

## Other publications

1. Ribeiro, A. C. O., Sousa, A. L., Duarte, J. P., Frutuoso e Melo, P. F. F., “Human Reliability Analysis as Management Tool” (in Portuguese), *Petro & Química*, v. 355, p. 43-44, ISSN/ISBN: 01015397, 2014.

## Refereed Conference Papers

### Thermal-hydraulics and Safety

1. Seo, K., Yoon, H., Kim, In G., Kim, S-H., Duarte, J.P., Corradini, M., “The Analysis and Comparison for Air-Water flow phenomena using TRACE”, *American Nuclear Society ANS Winter Meeting*, Virtual Meeting, 2020.
2. Hurley, P.\* and Duarte, J.P., “Fiber Optic Sensing Application in Quenching Temperature Measurement”, *American Nuclear Society (ANS) Winter Meeting*, Washington, D.C., USA, November 17-21, 2019.
3. Duarte, J.P., Yarsky, P., Zaki, T., and Corradini, M. L. 2019. Rod Bundle Post-CHF Heat Transfer Analysis at BWR Prototypical Conditions - Part 1: Inverse Heat Transfer. CHF and Post CHF Heat Transfer, Flooding and CCF. In: *18th International Topical Meeting on Nuclear Reactor Thermal Hydraulics - NURETH-18*, Portland, OR, U.S.A., Aug. 18-23.
4. Duarte, J.P., Yarsky, P., and Zaki, T., “Rod Bundle Post-CHF Heat Transfer Analysis at BWR Prototypical Conditions - Part 2: Heat Transfer Coefficients”, CHF and Post CHF Heat Transfer, Flooding and CCFL. In: *18th International Topical Meeting on Nuclear Reactor Thermal Hydraulics – NURETH-18*, Portland, OR, U.S.A., Aug. 18-23.
5. Yarsky, P., Zaki, T., Duarte, J.P. 2019. Preliminary Analysis of Measured Data from a Simulated BWR Fuel Assembly Undergoing Power and Flow Oscillations Representative of Anticipated Transient without Scram. Instabilities and Nonlinear Dynamics. In: *18th International Topical Meeting on Nuclear Reactor Thermal Hydraulics - NURETH-18*, Portland, OR, U.S.A., Aug. 18-23.
6. Duarte, J.P. Jo, H., Corradini, M.L., “Using Inverse Heat Transfer in the Analysis of Two-Phase Flow Post-CHF Experiments”, *International Topical Meeting on Advances in Thermal Hydraulics – 2018*, In: *ANS winter meeting 2018*, Orlando, FL, U.S.A., November 11-15, 2018.
7. Zhao, D., Duarte, J.P., Corradini, M. L., “Study on Rod Bundles CHF Prediction by Liquid Sublayer Dryout Model”, *ANS Annual Meeting, Computational Thermal Hydraulics II*, Volume 118, Philadelphia, Pennsylvania, U.S.A., June 17-21, 2018.
8. Duarte, J. P., Jo, H., Corradini, M. L., “Pre- and Post-CHF Study at the High Pressure Heat Transfer Facility”, *ANS Winter Meeting, Experimental Thermal Hydraulics II*, Volume 117, Washington, D.C., U.S.A., October 29-November 2, 2017.
9. Dong, X., Zhang, Z., Duarte, J. P., Corradini, M. L., Tian, Z., Chen, G., Cong, T., “Numerical Investigation of Critical Heat Flux Phenomena in a 2×2 Rod Bundle for a High Pressure Heat

Transfer Facility”, *The 17<sup>th</sup> International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-17)*, Xi’an, China, September 3-8, 2017.

10. Duarte, J. P., Corradini, M. L., “An Initial Assessment of Minimum Film Boiling Temperature Correlations and Comparison to Experimental Data”, Thermal-Hydraulics In: *International Conference on Nuclear Engineering – ICONE24*, Paper N. 61028, Charlotte, NC, U.S.A., June 26-30, 2016.
11. Oliveira, T. M. M., Duarte, J. P., Piqueira, J. R. C., “Simplified Simulation of a Thermal Hydraulic Loop for Critical Heat Flux Experiments”, Poster Jr. section In: *International Nuclear Atlantic Conference – INAC 2015*, Sao Paulo, SP, Brazil, October 4-9, 2015.
12. Duarte, J. P., Frutuoso e Melo, P. F., Piqueira, J. R. C., “An Initial Uncertainty Analysis on the Critical Heat Flux Evaluation for a Small-Scale Pressurized Nuclear Reactor Using the COBRA Code”, *The 16th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-16)*, p. 3017-3029, Chicago, United States, August 30-September 4, 2015.
13. Greenwood, M. S., Duarte, J. P., M. Corradini, “Comparison of Experimental Critical Heat Flux Data to Prediction Methods for Conditions Prototypical of Light Water Small Modular Reactors”, *The 16th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-16)*, p. 6257-6270, Chicago, United States, August 30-September 4, 2015.
14. Duarte, J. P., Taqueda, M. E. S., Piqueira, J. R. C., “Experimental Design for the Evaluation of Critical Heat Flux of Small-Scale Pressurized Nuclear Reactors”. In: *European Safety and Reliability Conference - ESREL*, Safety and Reliability: Methodology and Applications. London: Taylor & Francis Group, p. 923-928, Wroclaw, Poland, 2015.
15. Duarte, J. P., Riveiro, J. J., Alvim, A. C., Piqueira, J. R. C., Frutuoso e Melo, P. F. F., “Cold Water Injection and Rod Ejection Analysis of Annular Fueled PWRs by a Hybrid Lumped Parameter Model”. In: *22<sup>nd</sup> International Conference on Nuclear Engineering - ICONE*, Paper N. 30833, Volume 2B: Thermal Hydraulics, Prague, Czech Republic, 2014.
16. Duarte, J. P., Iliuk, I., Piqueira, J. R. C., “Thermal-hydraulic Analysis of Plate Fuel Small Pressurized Nuclear Reactors under a Loss of Flow Accident”. Proceeding of *VII Congresso Nacional de Engenharia Mecânica – CONEM*, Uberlândia, MG, Brazil, August 10-15, 2014.
17. Duarte, J. P., Su, J., Alvim, A. C. M., “Improved lumped parameter for annular fuel element thermal-hydraulic analysis”. *International Nuclear Atlantic Conference – INAC 2011*, Belo Horizonte, MG, Brazil, October 24-28, 2011.

#### Probabilistic Risk Assessment

18. Ribeiro, A. C. O., Duarte, J. P., Sousa, A. L., Frutuoso e Melo, P.F., “Quantifying Human Error Probabilities through a Bayesian Network using Expert Opinion and an Auditing Tool: An Application to the Tokai-Mura Accident”. In: *11th Global Congress on Process Safety, 30th Center for Chemical Process Safety International Conference (CCPS)*, Austin, United States, 2015.
19. Duarte, J. P., Leite, V. C. and Frutuoso e Melo, P. F., “A Comparison Between Markovian Models and Bayesian Networks for Treating Some Dependent Events in Reliability Evaluations”, *International Nuclear Atlantic Conference - INAC*, Recife, PE, Brazil, November 24-29, 2013.
20. Sousa, A. L., Ribeiro, A. C. O., Duarte, J. P. and Frutuoso e Melo, P. F., “On Applying Safety Archetypes to the Fukushima Accident to Identity Nonlinear Influencing Factors”, *International Nuclear Atlantic Conference - INAC*, Recife, PE, Brazil, November 24-29, 2013.
21. Alves, A. S. M., dos Passos, E. M., Duarte, J. P. and Frutuoso e Melo, P. F., “Radiological Risk Curves for the Liquid Radioactive Waste Transfer from Angra 1 to Angra 2 Nuclear Power Plants by a Container Tank”, *International Nuclear Atlantic Conference - INAC*, Recife, PE, Brazil,

November 24-29, 2013.

22. Ribeiro, A. C. O., Sousa, A. L., Frutuoso e Melo, P.F., Duarte, J. P., “Quantifying Human Error Probability Through a Human Factors Assessment Tool”. *Latin American Conference on Process Safety*, Center for Chemical Process Safety (CCPS), Paper N. IBP435\_12, American Institute of Chemical Engineers, Rio de Janeiro, RJ, Brazil, 2012.
23. Alves, A. S. M., Passos, E. M., Duarte, J. P., Frutuoso e Melo, P.F., “Safety and Risk Analysis of Liquid Radioactive Waste Transfer from Angra 1 to Angra 2 Nuclear Power Plants through a Container Tank”, *The Annual European Safety and Reliability Conference - ESREL*, Volume 5, p. 3714, Helsinki, Finland, June 25-29, 2012.
24. Saldanha, P. L. C., Sousa, A. L., Frutuoso e Melo, P. F., Duarte, J. P., “Technical Specifications Review of Nuclear Power Plants: a Risk-Informed Evaluation. *14th Brazilian Congress of Thermal Sciences and Engineering - ENCIT*, Rio de Janeiro, RJ, Brazil, November 18-22, 2012.

### **Presentations at Professional Meetings (Selected)**

1. Ahmed, K. K., **Duarte, J. P.**, Scarlat, R. O., “Overview of RELAP-7 Benchmarking Tests and Planned Experiments at UW-Madison Thermal Hydraulic Facilities”, *ANS Student Conference*, Madison, WI, U.S.A., 2016.
2. **Duarte, J. P.**, Piqueira, J. R. C., “A Design of Experiments for Critical Heat Flux Evaluation of a Small-Scale Pressurized Water Reactor” (in Portuguese), *1<sup>st</sup> Young Researchers Workshop of the Brazilian Navy*, Sao Paulo, Brazil, 2014.
3. **Duarte, J. P.**, Piqueira, J. R. C., “A Discussion on the Prediction of Critical Heat Flux for Nuclear Reactors” (in Portuguese), *3<sup>rd</sup> Academic Week of Nuclear Engineering*, Federal University of Rio de Janeiro, Brazil, 2013.
4. **Duarte, J. P.**, Frutuoso e Melo, P. F., “Bayesian Network Approach for Human Reliability Analysis” (in Portuguese), *Giulio Massarani Meeting on Scientific Initiation*, Federal University of Rio de Janeiro, Brazil, 2012.
5. **Duarte, J. P.**, Alvim, A. C. M., Su, J., “Improved Lumped Parameter Approach for Transient Heat Conduction Analysis in Annular Fuel Rods with Neutronic Coupling” (in Portuguese), *Giulio Massarani Meeting on Scientific Initiation*, Federal University of Rio de Janeiro, Brazil, 2011.
6. **Duarte, J. P.**, Su, J., Silva, F. C., “A Simplified Model for a PWR Core Dynamic Behavior Analysis with Neutronic and Thermal-hydraulic Coupling” (in Portuguese), *Giulio Massarani Meeting on Scientific Initiation*, Federal University of Rio de Janeiro, Brazil, 2011.

### **Technical Reports**

1. Brooks, P., Coddington, B., **Duarte, J. P.**, Buelow P., Corradini, M., Anderson, M., Critical Heat Flux Testing Direct (Resistance) Heated Rod, University of Wisconsin, Thermal Hydraulics Laboratory, January 4 – February 27, 2017. *In: General Atomics, Reactor-Based Molybdenum-99 Supply System Project. Critical Heat Flux Testing at the University of Wisconsin Final Report*, 30441R00041/A, 2017. ADAMS Accession No. ML17172A199.
2. **Duarte, J. P.**, Analysis of the Pressure Drop Measurements STS123.01. ADAMS Accession No. ML17047A494, 2017.
3. **Duarte, J. P.**, Passos, E. M. and Alves, A. S. M., "Accident Analysis of a Packed Fall at the Monitoring Building Center for Waste Management at Admiral Álvaro Alberto Nuclear Power Station: Atmospheric Dispersion and Dose Calculation" (in Portuguese), Eletrobrás Termonuclear S.A., Rio de Janeiro, Brazil, 2013.



4. **Duarte, J. P.**, Passos, E. M., Alves, A. S. M., “Accident Analysis of a Radioactive Package Fall in a Rain Channel During its Transfer from Angra 1 NPP to Angra 2 NPP at the Admiral Álvaro Alberto Nuclear Power Station” (in Portuguese), Eletrobrás Termonuclear S.A., Rio de Janeiro, Brazil, 2012.

#### INVITED TALKS

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1. Duarte, J.P., “Understanding the Post-CHF Flow Boiling Heat Transfer at High-Pressure”. Texas A&M, 2020, March 3rd, College Station, 2020.
2. Duarte, J.P., “A Review of Quenching Experiments and Application of Fiber Optic Sensing”. The U.S. Nuclear Regulatory Commission, Washington D.C., Nov. 20th, 2019.
3. Duarte, J.P., “Understanding the Post-CHF Flow Boiling Heat Transfer at High-Pressure”. Virginia Polytechnic Institute and State University, Blacksburg, VA, April 10th, 2018.
4. Duarte, J.P., “Safety Aspects of New Nuclear Reactors and Installations”. The Pennsylvania State University, State College, PA, Nov. 28th, 2017.
5. Duarte, J.P., “Experimental Investigation of Post-CHF Heat Transfer Under High-Pressure Forced Convective Flow”. The U.S. Nuclear Regulatory Commission, Washington, D.C., Nov. 3rd, 2017.

#### FUNDED GRANTS AND CONTRACTS

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<b>Funding Category</b>	<b>Total</b>	<b>Personal Share Total</b>
<i>External</i>	\$2,744,456	\$1,336,743
<i>Internal</i>	\$63,649	\$59,977
<b><i>Total Funded Research</i></b>	\$2,808,105	\$1,396,720

- Duarte, J.P. (PI), Liu, Y., Kozlowski, T., Corradini, M., “Non-Dimensional Analysis of Density-Wave Instabilities and Dryout-Rewet Cycles during an ATWS”, U.S. Nuclear Regulatory Commission, \$499,517, 04/2021-03/2024.
- Duarte, J.P. (PI), Lu, K., “Accelerated Experiments to Investigate Chloride-Induced Stress Corrosion Cracking”, Institute for Critical Technology and Applied Science (ICTAS), Virginia Tech, \$10,000, 10/2020 – 06/2021.
- Duarte, J.P. (PI), Lattimer, B., Corradini, M., Wang, J., “Identifying Needed Fire Input Data to Reduce Modeling Uncertainty”, NEUP-DOE, \$799,392, 10/2020-09/2023.
- Duarte, J.P. (PI), Cai, W., Schmid, S., “Investigation of Spent Nuclear Fuel (SNF) Dry Cask System for Long-Term Storage”, Intelligent Infrastructure for Human Centered Communities (IIHCC), Virginia Tech, \$50,000, 07/2020-06/2021.
- Eskandarian, A. (PI), Duarte, J. P. (Junior Faculty), “Faculty Development Program in Nuclear Engineering at Virginia Tech”, U.S. NRC, \$450,000, 08/2019-08/2022.
- Roberson, M. (PI), Duarte, J.P. (Co-PI), “Metamaterial Void Sensor for Fast Transient Testing”, DOE-SBIR/STTR Phase II-Release 2, \$995,546, 08/2019-08/2021. \$335,955.00 to Virginia Tech.
- Duarte, J.P. (PI), “Iterative Use of Technology in a Thermodynamics Classroom”, Large Class Grant – Center for Excellence in Teaching and Learning (CELT), Virginia Tech, \$3,649, 08/2019-05/2020.

## **INTERNATIONAL TRAINING**

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- 14-18 July 2014            NRSHOT – TRACE beginner course  
The School of Industrial Engineering of Barcelona, ETSIB-UPC, Spain
- Mar. 31 – Apr. 4, 2014    3D S.UN.COP – Seminar and Training on Scaling Uncertainty and 3D  
Coupled Code Calculations in Nuclear Technology  
Texas A&M University System, U.S.A.

## **PROFESSIONAL SOCIETIES**

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American Nuclear Society (ANS)  
Regional Council of Engineering and Agronomy of Rio de Janeiro State (CREA/RJ)  
Women in Nuclear (WiN) – Global and Brazil

## **PROFESSIONAL SERVICE**

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- Review Editor
  - 2020 – Present, Energy Research (impact factor 2.746)
- Scientific Journal Referee
  - 2020 – Present, Sustainability
  - 2019 – Present, Applied Thermal Engineering
  - 2018 – Present, MethodsX
  - 2019 – Present, Journal of Industrial Ergonomics
  - 2018 – Present, Experimental Thermal and Fluid Science
  - 2018 – Present, Annals of Nuclear Energy
  - 2017 – Present, Nuclear Engineering and Design
  - 2017 – Present, Journal of Taibah University for Science
  - 2017 – Present, Nuclear Technology
  - 2016 – Present, Nuclear Science and Engineering
- International Conference Referee
  - The Third International Conference on Physics, Mathematics and Statistics (ICPMS), 2020
  - International Conference on Nuclear Engineering (ICONE), 2016-2017
- Proposal Reviewer
  - DOE SBIR Phase I and Phase II
  - DOE NEUP
- Served as reviewer for the 2019 Graduate Women in Science (GWIS) National Fellowship Program.

## **UNIVERSITY SERVICE**

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- Member of the Graduate Admission Committee, ME Dept, 2020-present
- Member of the Nuclear Regulatory Commission Fellowship Selection Committee, NE Program, 2020-present

## **OUTREACH AND EXTENSION ACTIVITIES**

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- Served as judge for the 2021 Spellman High Voltage Electronics Clean Tech Competition “Preserving Planet Earth”.
- Galileo Guest Speaker (10/8), Galapatia “Slush Rush” (10/9/20 and 10/30/20), CEED Galileo-Hypatia freshman seminar speakers, Virginia Tech.

- Served as judge for the 2019 Spellman High Voltage Electronics Clean Tech Competition “Toward A Greener Tomorrow”.

### **DIVERSITY**

- Participation in the Summer Diversity Summit, Technology Enhanced Learning and Online Strategies (TLOS): Professional Development Network, February 25, 2021.
- Duarte, J.P., Hin, C., Islam, J., Prince, S., Tariq, M., “Women in STEAM panel discussion”, NASA Space Apps Challenge Virginia (virtual event), Oct. 3<sup>rd</sup>, 2020 (invited panelist).
- Duarte, J. P., Cunha, A., Gomes, M. R. S., Carvalheira, L., Lima, I. (moderator), “Panel Discussion: Nuclear Research in Times of Pandemic from the Prism of the Woman Universe”, Virtual festival promoted by the Federal University of Rio de Janeiro, Brazil, to celebrate its 100th Anniversary (invited panelist).
- Interview. The interview is part of Camila Faiçal Cruz’s M.Sc. thesis entitled “Women Entrepreneurship in Nuclear Area: A Historical Survey of the Nuclear Sector and the Role of Women in Brazil” (In Portuguese: Empreendedorismo Feminino na Área Nuclear: Um Levantamento Histórico do Setor e a Atuação Feminina no Brasil). Federal University of Paraná, Brazil, 2019.

### **CONFERENCES, PANELS, WORKSHOPS, ETC. LED OR ORGANIZED**

- Session Chair/Co-chair in the 18th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH), Portland, OR, August 18-23, 2019, in the following sessions:
  - CHF and Post CHF Heat Transfer, Flooding and CCFL—I
  - CHF and Post CHF Heat Transfer, Flooding and CCFL—II
  - Fundamental Thermal Hydraulics: General—II
  - Fundamental Thermal Hydraulics: General—III
- Chair, First Academic Week of Nuclear Engineering – Federal University of Rio de Janeiro, Brazil. August 15-19th, 2011.
- Co-Chair, Fifth Physics Week, State University of Campinas, Brazil. August 7-11th, 2006.

### **LANGUAGES SKILLS**

Portuguese – native speaker  
 English – fluent

### **VOLUNTEER ACTIVITY**

Aug. 2010 – Student Storytellers Project  
 Feb. 2011 Martagão Gesteira Child and Infant Institute Humanization Center, Rio de Janeiro, Brazil

### **ACTIVITIES CANCELLED DUE TO COVID-19 PANDEMIC**

- Invited speaker in the National Conference in Mechanical Engineering (CONEM), Teresina, PI, Brazil, August 02-06, 2020.
- Invited talk to kindergarten visit to Giles County’s Eastern Elementary/Middle School as part of the Girls Launch! Science visits project, May 2020.
- Invited panelist to the “Post-grads academic job & PhD applications workshop / Q&A”, organized by El Centro - Hispanic and Latinx Cultural and Community Center – at Virginia Tech, spring 2020.