**Marie ROMEDENNE** Cell: (+1) 865 978 27492519 Eppie Cove Lane romedennem@ornl.gov  
Knoxville TN 37931

**Expert in High Temperature Materials Degradation Characterization and Modeling**

Research Interests: Materials Science, Corrosion, Oxidation

High Temperature Oxidation:

* Additively manufactured Ni-superalloys, Heat resistant steels
* Oxidation lifetime modeling in air + water vapor (Ni and Fe-based alloy and foils)

Corrosion in liquid metals and liquid metal embrittlement

* Na (austenitic/ ferritic steels, ODS FeCrAl)
* PbLi (SiC, ODS FeCrAl)
* Li (F82H steel)

Education:

**2015 – 2018 (October): Institut National Polytechnique de Toulouse / CEA-Saclay (France)  
*Ph.D. in Materials Sciences***

Characterization and modeling of the carburization of a stainless steel in liquid sodium for Generation IV nuclear reactors

Research Experience:

**2021 (May) – Present: Oak Ridge National Laboratory (TN, USA), Materials Science and Technology Div.**

*1* year ***Research and Development Associate***

* High-temperature (< 1,000 °C) isothermal (Thermogravimetric analysis, box furnace) and cyclic oxidation exposures in O2, H2O, N2 of Ni- and Fe-based alloys/ superalloys and foils conventionally casted and additively manufactured
* High-temperature (< 700°C) liquid metal capsule and thermal convection loop exposures of steels, Oxide Dispersion Strengthened Steels liquid metals, aluminized ferritic steels (Na, PbLi, Li)
* Room temperature tensile testing
* High temperature liquid metal embrittlement testing
* Steel and superalloys metallurgy
* Oxidation/ Corrosion lifetime modeling (Python, Matlab)
* Machine learning of oxidation
* Thermodynamic and kinetic modeling
* Characterization of oxidized and corroded specimens: Electron Microscopy, Transmission Electron Microscopy, Electron Probe MicroAnalysis, X-ray diffraction, Electron Backscatter Diffraction, Atom Probe Tomography
* High Flux Isotope Reactor exposures

**2019 (January) – 2021 (May): Oak Ridge National Laboratory (TN, USA), Materials Science and Technology Div.**

*2.5* years ***Postdoctoral Research Associate***

* High-temperature (< 1,000 °C) isothermal (Thermogravimetric analysis, box furnace) and cyclic oxidation exposures in O2, H2O, N2 of Ni- and Fe-based alloys/ superalloys and foils conventionally casted and additively manufactured
* High-temperature (< 700°C) liquid metal capsule of steels, Oxide Dispersion Strengthened Steels liquid metals (Na)
* Room temperature tensile testing
* Steel and superalloys metallurgy
* Oxidation/ Corrosion lifetime modeling (Python, Matlab)
* Machine learning of oxidation
* Thermodynamic and kinetic modeling
* Characterization of oxidized and corroded specimens: Electron Microscopy, Transmission Electron Microscopy, Electron Probe MicroAnalysis, X-ray diffraction, Electron Backscatter Diffraction

**2014: McGill University (Montreal, Canada)**

*3 months* ***Research Assistant***

* Thermo-mechanical analysis of polymers
* Analytical modeling of physical behavior

Synergistic activities:

* TMS member
* Member of Corrosion and Environmentally Effects committee
* Reviewer
  + Oxidation of Metals (x3)
  + Materials at High Temperatures (x1)
  + Materials and Corrosion (x1)
  + Metallurgical Research and Technology (x1)
  + Journal of Materials Science & Technology (x1)
  + The Journal of The Minerals, Metals & Materials Society (x1)
  + Journal of Alloys and Compounds (x1)
* Best poster Award (2023), Gordon Research Conference
* Best Poster Award (2017), Gordon Research Seminar
* Treasurer at ORNL Postdoctoral Association (ORPA)