

## [NRRE Profile](#)

### **RESEARCH DIRECTIONS**

#### **1. Advanced membrane processes for water treatment and industrial separations**

- Design and optimization of integrated membrane and hybrid processes for desalination, potable water and waste-water treatment.
- Membrane colloidal fouling and scaling. Assessment and mitigation methods.
- CFD and experimental studies of flow and transport phenomena in membrane modules for equipment development and optimization of operating conditions.
- Membrane Bio-Reactors (MBR) for municipal and industrial waste-water treatment
- Development of sensors and advanced process monitoring equipment

#### **2. Environmental pollution - Impact on human health, modeling, monitoring**

- Assessment of aggregate and cumulative human exposure to mixtures of environmental pollutants through all environmental media
- Design and optimization of technological strategies for the protection of public health from exposure to environmental pollutants

#### **3. Utilization of renewable energy sources**

- Assessment of geothermal fluids and processes for various applications
- Direct utilization of RES (solar) for water desalination and effluent treatment

#### **4. Dynamics of liquid/liquid, gas/liquid and solid/liquid systems**

- Advanced simulation of processes involving population balances combined with spatially distributed phenomena.
- Simulation of evolving dilute dispersions in process equipment

### [Activities related to Membranes, Water and Wastewater Treatment](#)