

# Nano- and Micro- Fabrication based research at RMC

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# PAMM Contribution

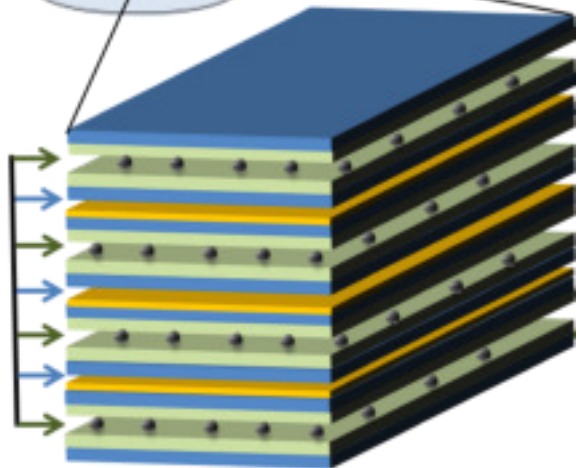
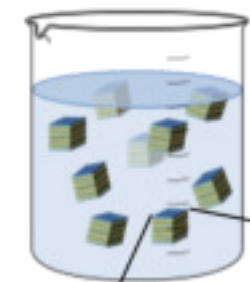
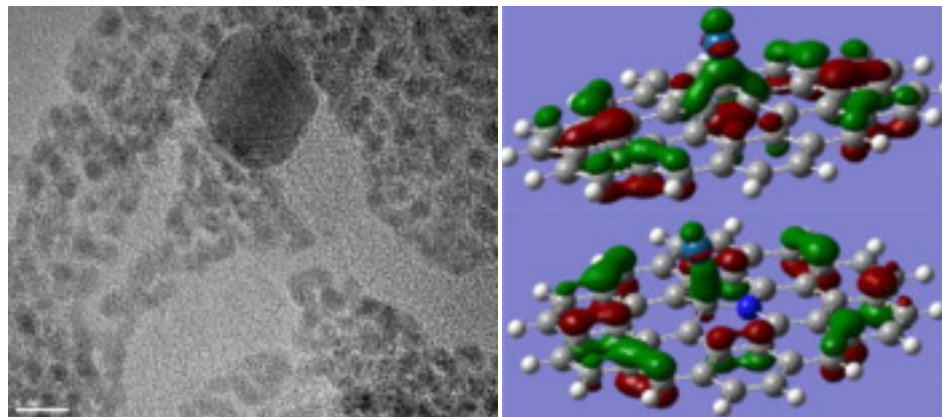
- **RMC**
  - Mechanical and Aerospace Engineering
  - Chemistry and Chemical Engineering
- **Methodology:**
  - High-fidelity simulations will guide nanofabrication
  - Characterization of prototypes in the later stages
- **Applications:**
  - Nanoreactors applied to energy and materials
  - Nano-catalysis
  - Advanced nanomaterials (*e.g.* Graphene/Nanotubes)
  - Space-related nanotechnology-based applications
  - Electric propulsion for micro-satellites and nano-satellites

# Nanoreactors: Mimicking natural processes

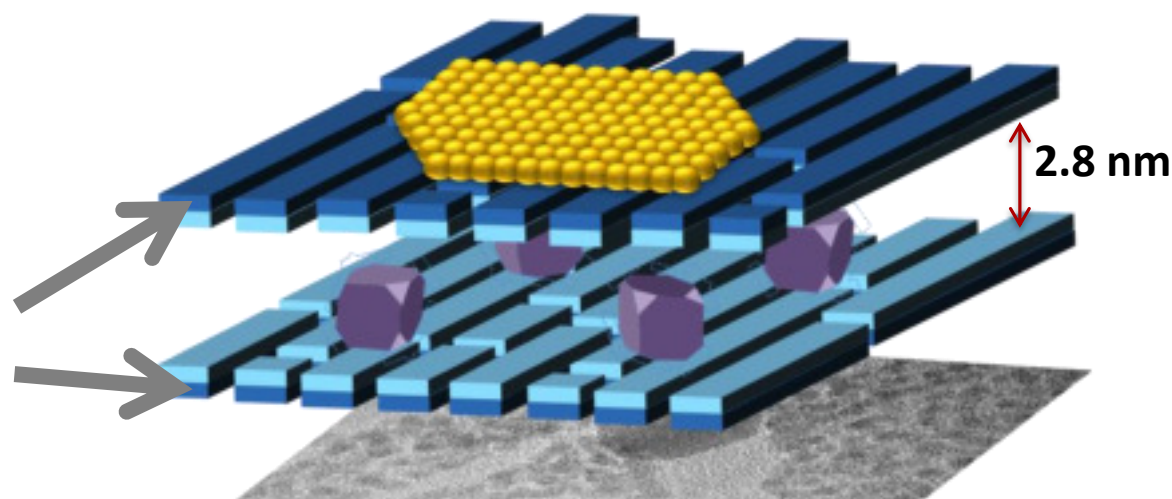
Enzyme structure provides nanoscale reaction spaces which increase substrate concentration and reactivity combining:

- **Confinement**
- **Metal catalysts**
- **Graphene**

Unsupported nanoreactors in aqueous environment at neutral pH



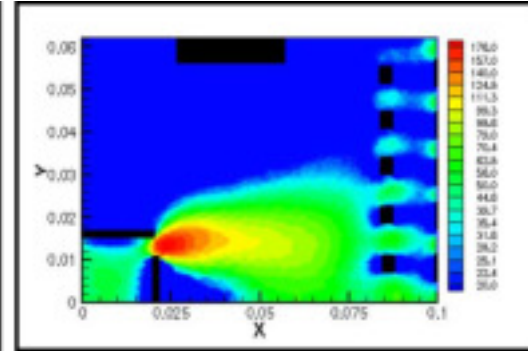
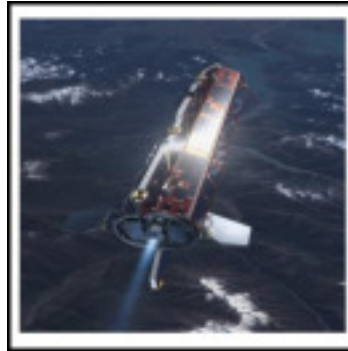
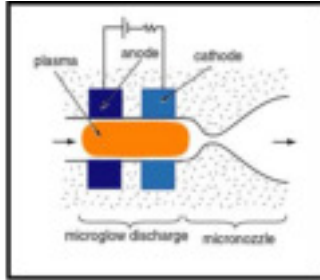
Confined hydrophilic and hydrophobic active centers



Supramolecular nanostructure that hosts and catalyzes non-spontaneous reactions in aqueous solution.

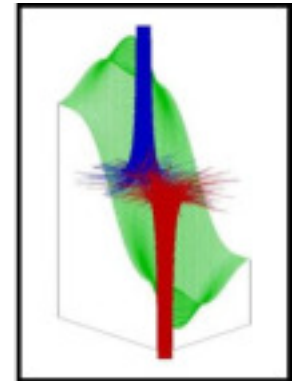
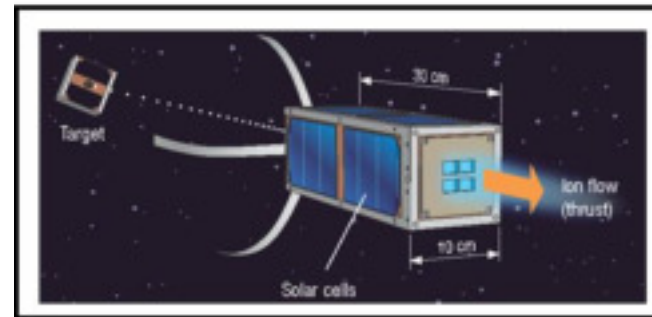
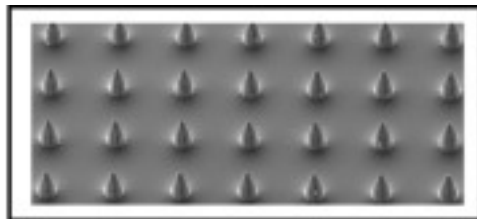
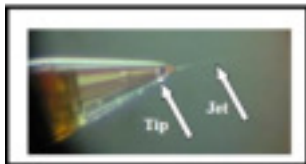
# Electric propulsion for Spacecraft

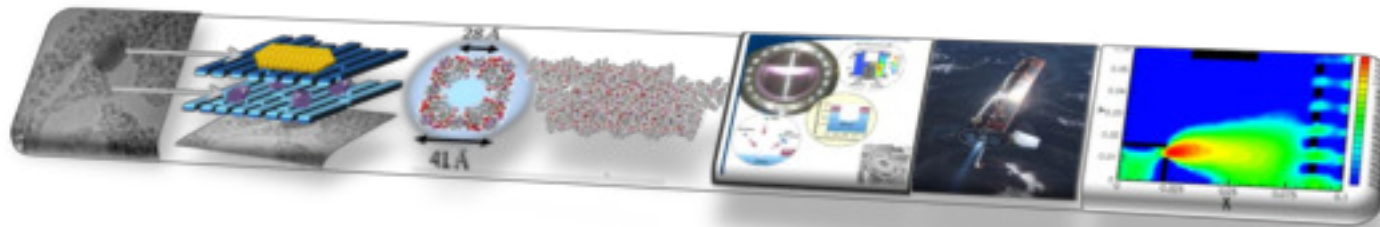
- High exhaust velocity (10 x compared to classical)
- Fuel efficiency
- Micro-satellites



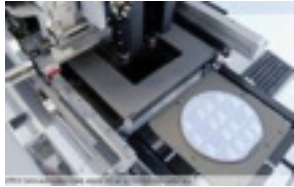
Nanofabrication of elements or entire miniaturized engine

- Nanofabricated electrospay
- Self-neutralizing
- Nanosatellites





## PAMM-CFI:



Nano Imprint



WDXRF elemental analysis



X-Ray  
diffractometer



Low Pressure  
CVD Reactor

## For more information:

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