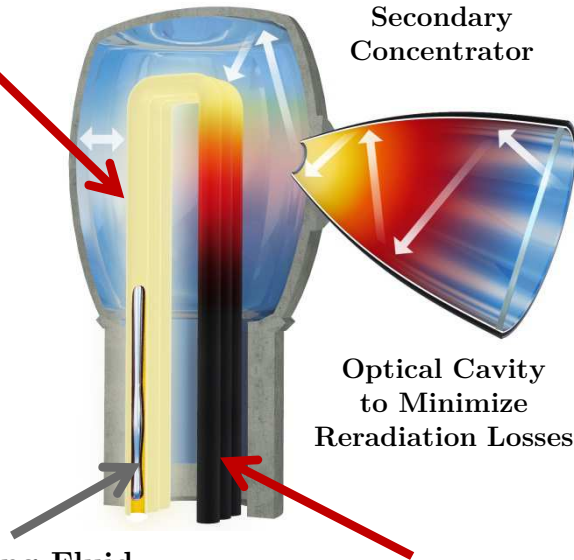


# Ceramic Containment Materials for High Temperature Concentrated Solar Power (CSP)

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Higher Temperature → Higher Efficiency → Lower Cost

565°C → 1500°C

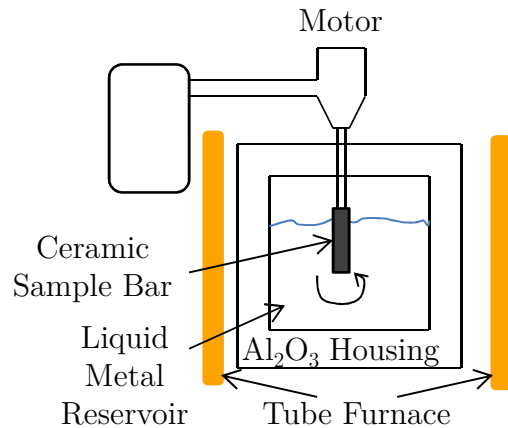


Liquid Metal Working Fluid  
Tin [232°C - 2602°C]  
Aluminum [660°C - 2519°C]

Corrosion Properties  
Not Well Understood

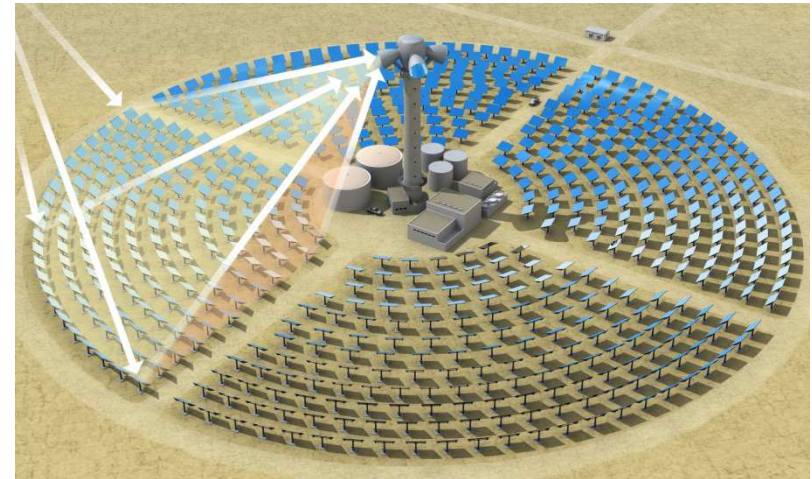
High  $\kappa$  Ceramic Pipes

High Temperature  $\kappa$   
For Carbides  
Not Well Understood



Materials of Interest

Low Thermal Conductivity	High Thermal Conductivity
▪ Al <sub>2</sub> O <sub>3</sub>	▪ AlN
▪ MgO	▪ Si <sub>3</sub> N <sub>4</sub>
▪ ZrO <sub>2</sub>	▪ SiC
▪ CaO	▪ WC
	▪ ZrC
	▪ TiC



First Principles (DFT) Molecular Dynamics

