



Tuesday, 28 March 2023

# Spark Award

Top 20 inventions filed as patents in 2022



## Solar receiver delivering heat at 1600°C to decarbonize cement and metals processing



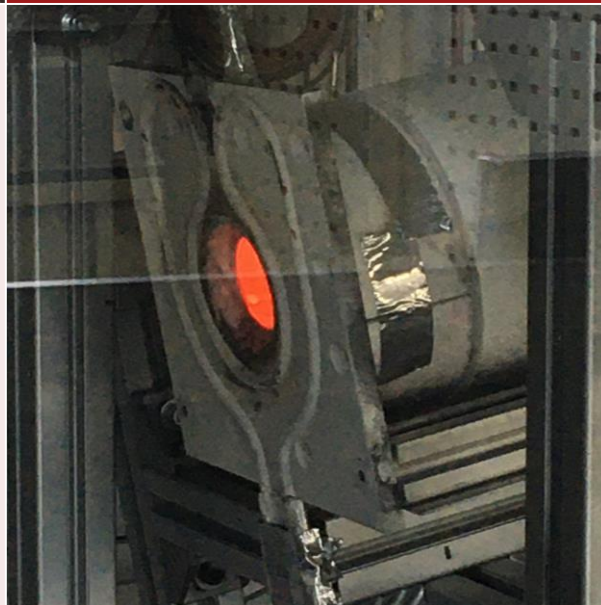
### What's the technical challenge?

Manufacturing of cement and metals causes 20% of global CO<sub>2</sub> emissions. Concentrated solar techs provide a pathway to decarbonization, but existing solar receivers operate at 600°C max, while these industries need heat above 1000°C

### What's the technical solution?

Our invention creates a protective liquid-vapor layer onto the receiver window, increasing efficiency and reliability of the device. Our prototype delivered steam at 1600°C with an unprecedented receiver efficiency exceeding 70%

**What's the use?**  
Our invention enables the design of solar receivers capable of delivering heat at  $T > 1000^\circ\text{C}$  with high efficiency. This paves the way towards the solarization of key industries and the achievement of ambitious climate goals



### Professorship of Renewable Energy Carriers (PREC)



Dr. Emiliano Casati

Prof. Aldo Steinfeld

