

High-Temperature Falling Particle Receiver Project Overview

SAND2015-8639PE

*Exceptional service
in the national interest*



Contributors:

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Georgia Institute of Technology

Bucknell University

King Saud University

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Concentrating Solar Technologies

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SAND2015-XXXX (contents from 7383 PE)

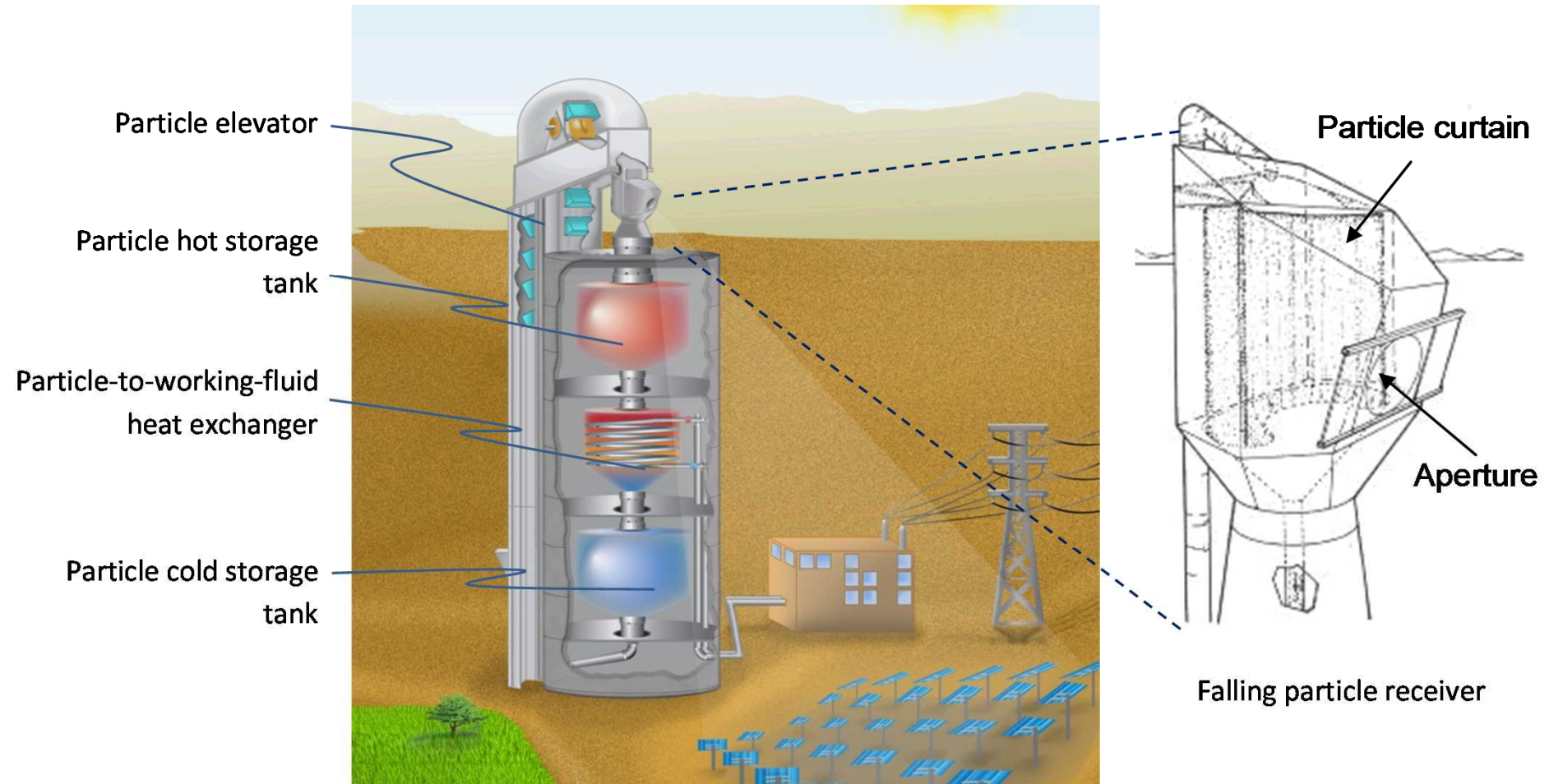


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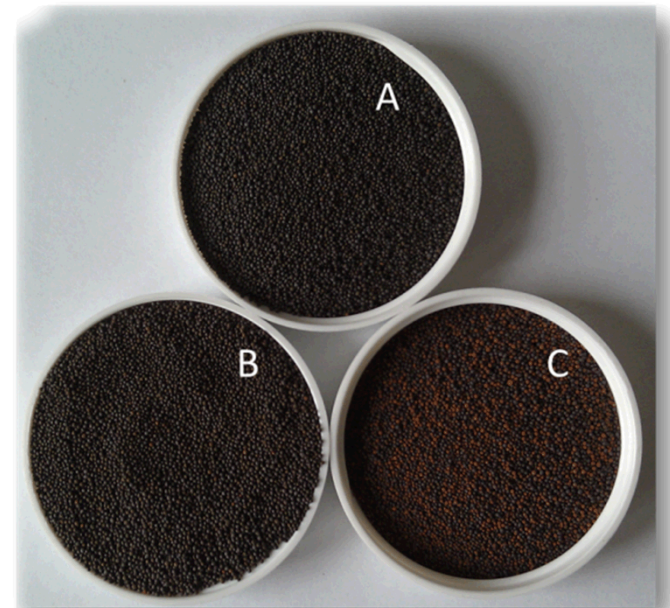
High Temperature Falling Particle Receiver

(DOE SunShot Award FY13 – FY15)



Advantages of Particle Receivers

- Direct heating of particles
 - Higher temperatures than conventional molten salts
 - Enable more efficient power cycles
 - Higher solar fluxes for increased receiver efficiency
- Direct storage of hot particles
 - Reduced costs

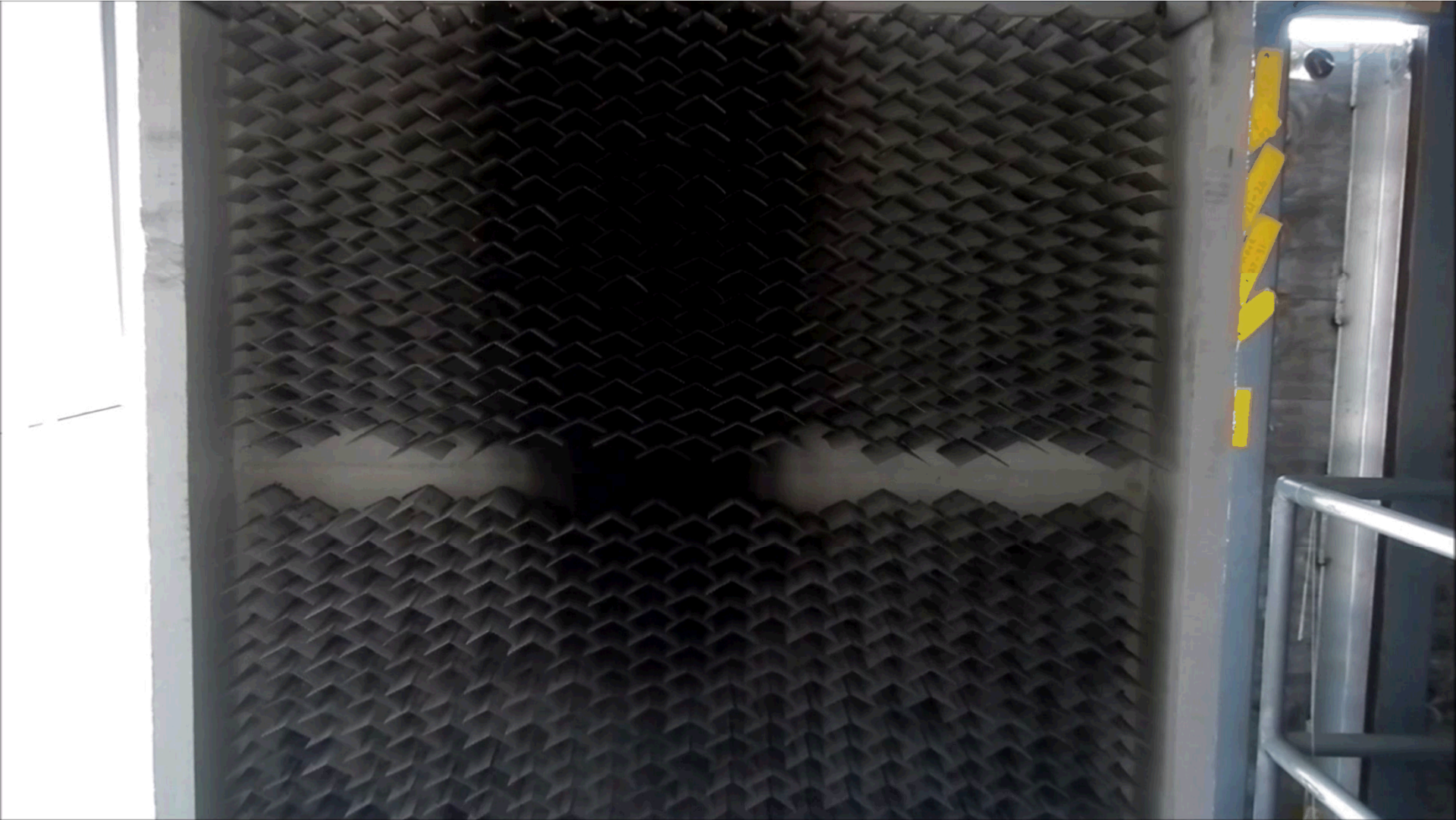


CARBO ceramic particles (“proppants”)

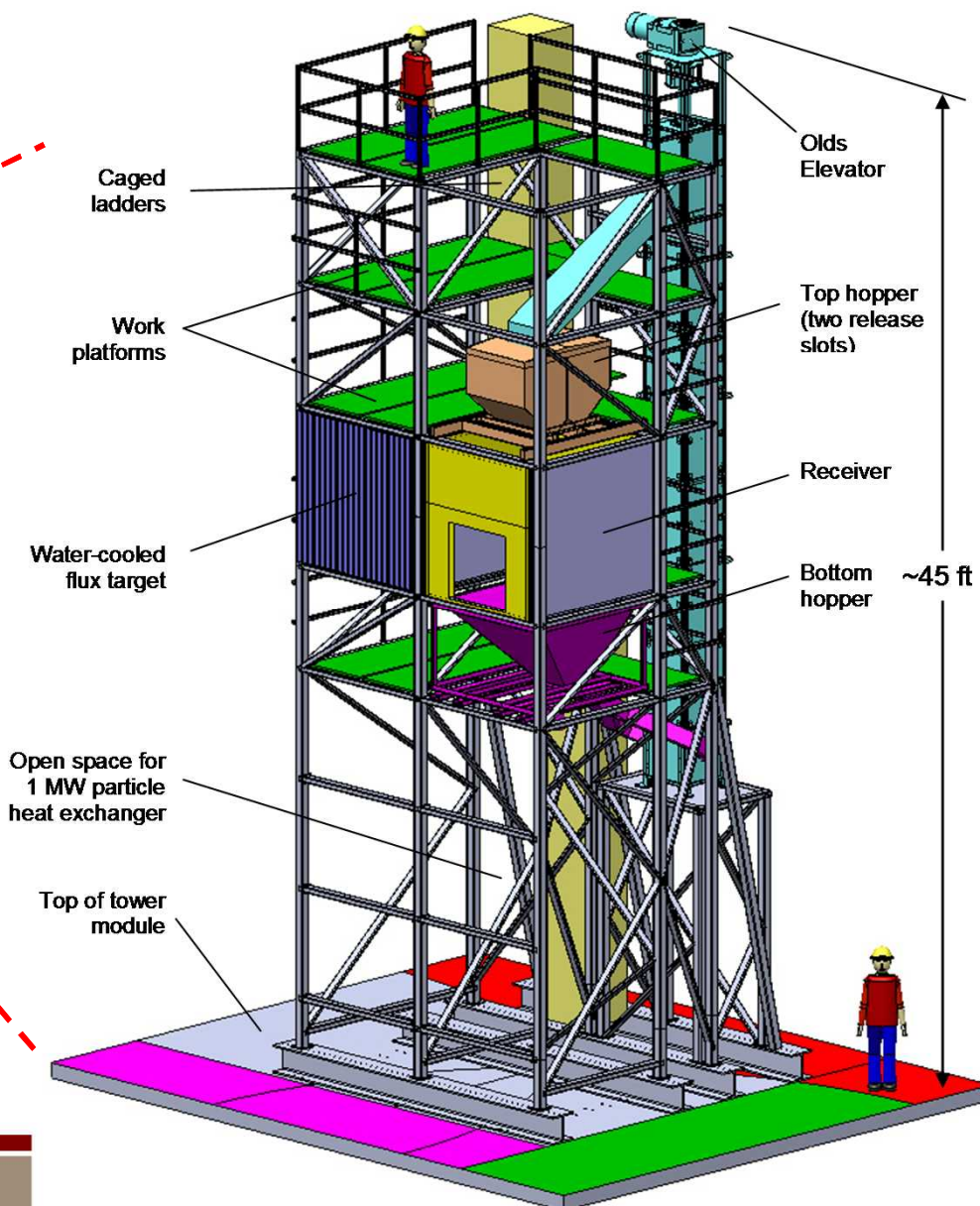
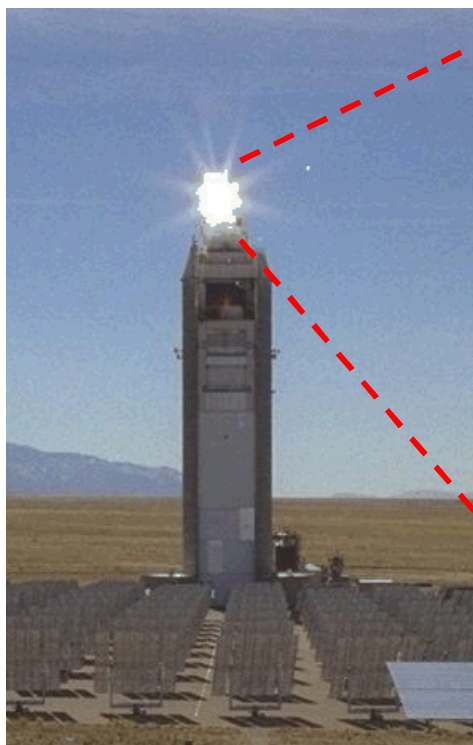
Particle Receiver Designs – Free Falling



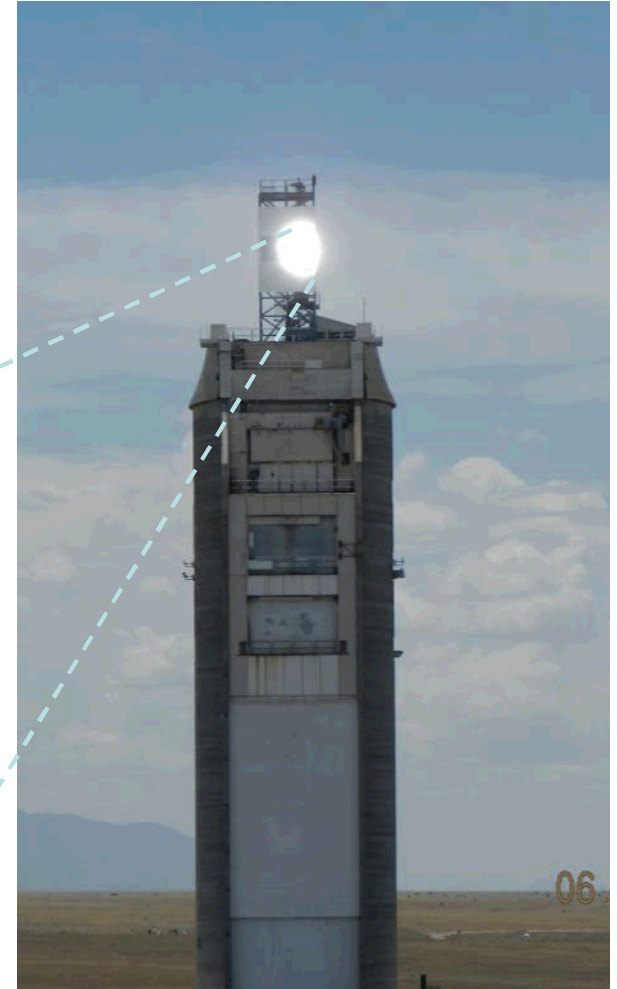
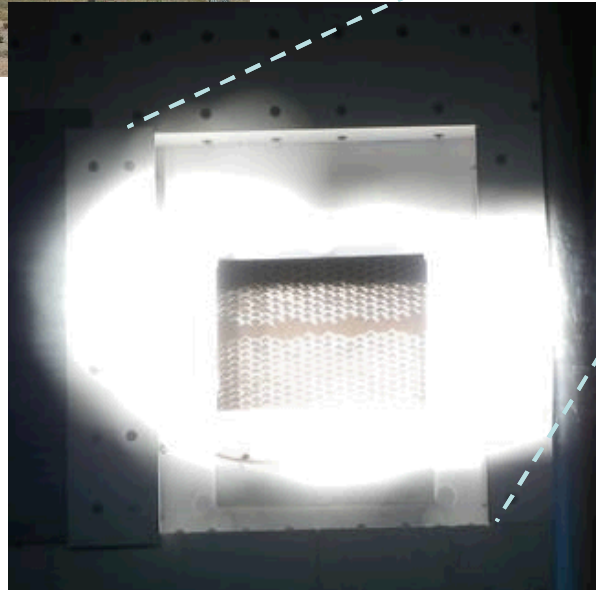
Particle Receiver Designs – Pachinko



Prototype System Design



On-Sun Tower Testing



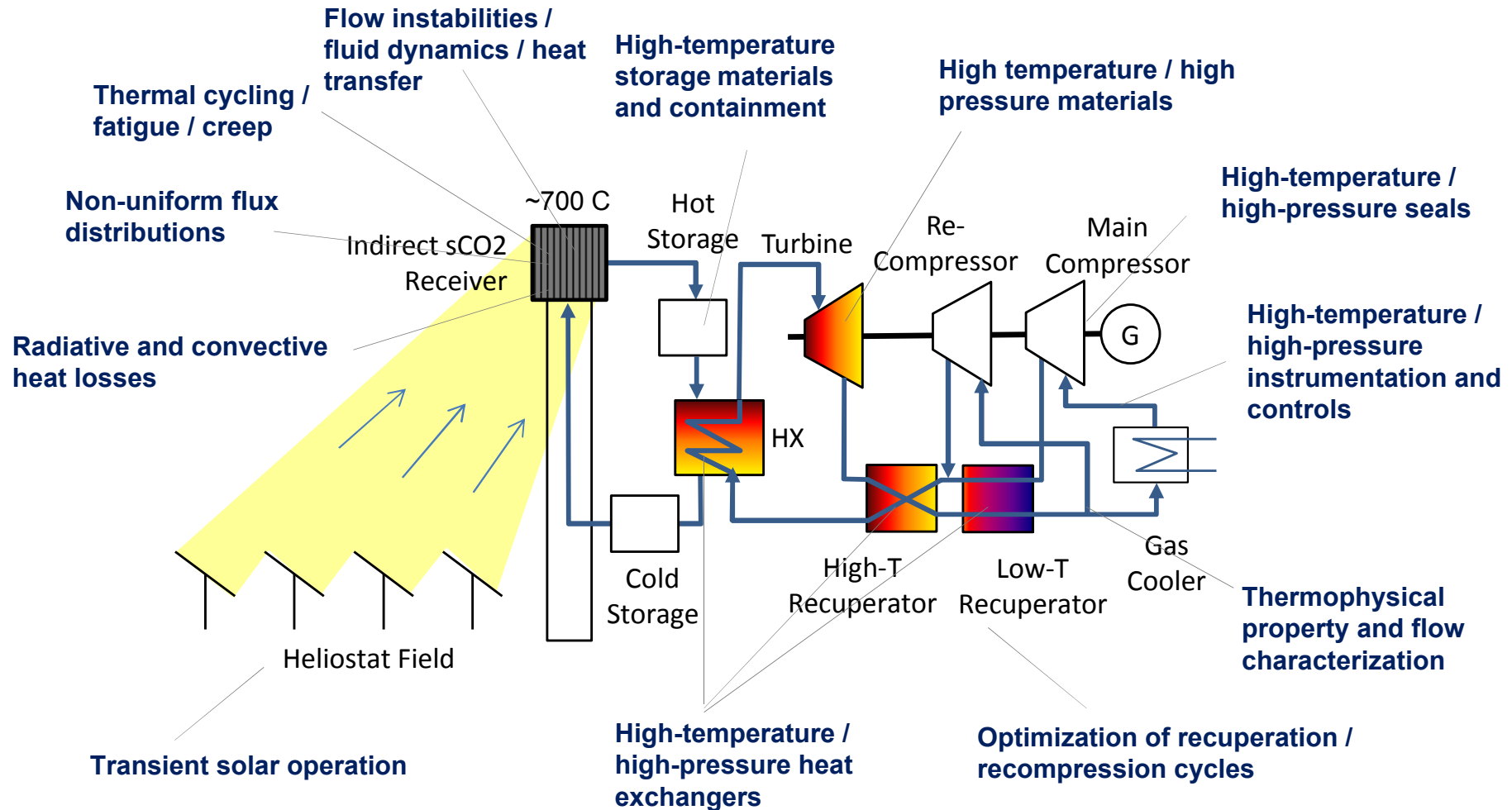
Over 300 suns on receiver
(June 25, 2015)

On-Sun Tower Testing



Over 600 suns peak flux on receiver
(July 20, 2015)

Solarized Supercritical CO₂ Power Cycle



Presentations at SolarPACES 2015

- **Wednesday, Oct. 14**

- 10:30, Auditorium 1, Josh Christian – Particle Receiver Design Requirements
- 11:10, Auditorium 1, Roberto Zanino – Discrete Element Modeling Free-Falling Particle Curtain
- 15:05, Auditorium 1, Ken Armijo – Using Magnetic Field to Control Particle Flow

- **Thursday, Oct. 15**

- 11:10, Auditorium 1, Cliff Ho – On-Sun Testing of Particle Receiver

Acknowledgments



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