

2008 Solar Annual Review Meeting

Session: Silicon Platform

Organization: National Renewable Energy Lab

Funding Opportunity: NREL Core Program



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Wafer Si

High efficiency heterojunction solar cells

Better surface and bulk passivation using thin films

Film Si: a-Si based PV

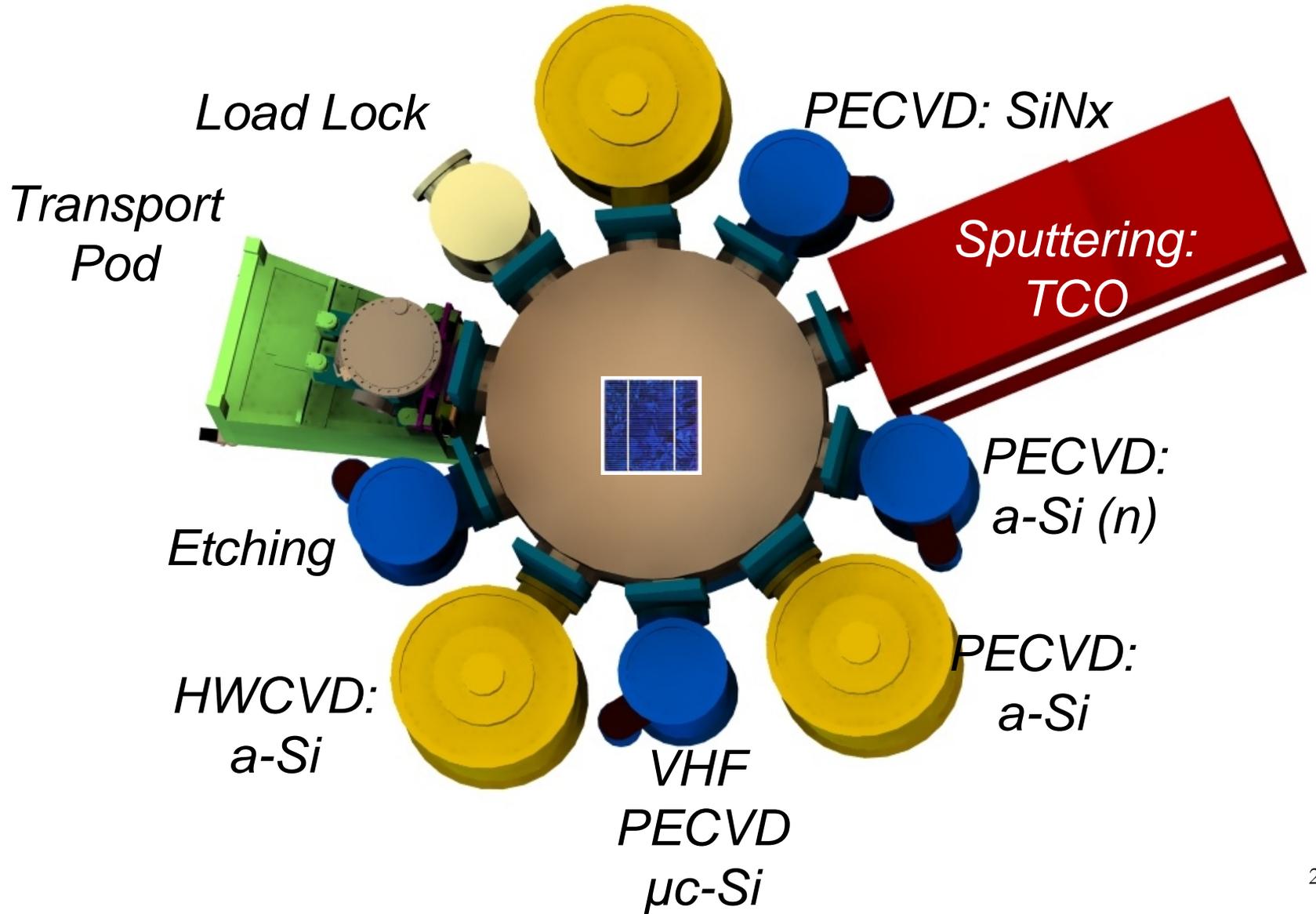
a-Si:H based solar cells

nc-Si:H solar cell

a-Si based materials



PECVD: a-Si (p)





Sept. 17, 2007



Si cluster Tool: advanced system

The platform has been installed and received the first Operational Readiness Review (ORR). Corrective actions based on this inspection are being implemented

- Large area (15.7 x 15.7 cm² or 6" x 6")
- Multi-chamber deposition with loadlock and robotic arm
 - PE-, HW-CVD, and Sputtering up to 450°C
- High throughput experimentation
 - Discrete sampling
 - Continuous variation
 - Thickness
 - Temperature
- Capable of fabricating a device in the vacuum
- Capable of in-situ monitoring growth
- Capable of transferring sample via T-pod to other tools

Research Projects



- Materials
 - a-Si:H, a-SiGe:H, a-SiC:H, a-SiNx, nc-Si
 - ITO and ZnO
- Devices
 - c-Si heterojunction solar cell
 - mc-Si passivation and device
 - a-Si:H based solar cells
 - nc-Si solar cells
 - Tandem solar cells
 - Novel-Si such as embedded quantum dots

Silicon Platform Collaborations



Industry partners identified
a-Si:H passivation
SiN _x passivation
a-Si:H based Si cells and mini module
Silicon Heterojunction solar cells on c-Si wafers
SHJ back contact
nc-Si solar cells
TCO coated substrate
TCO coated substrate

More partners are welcome!