SunShot
U.S. Department of Energy

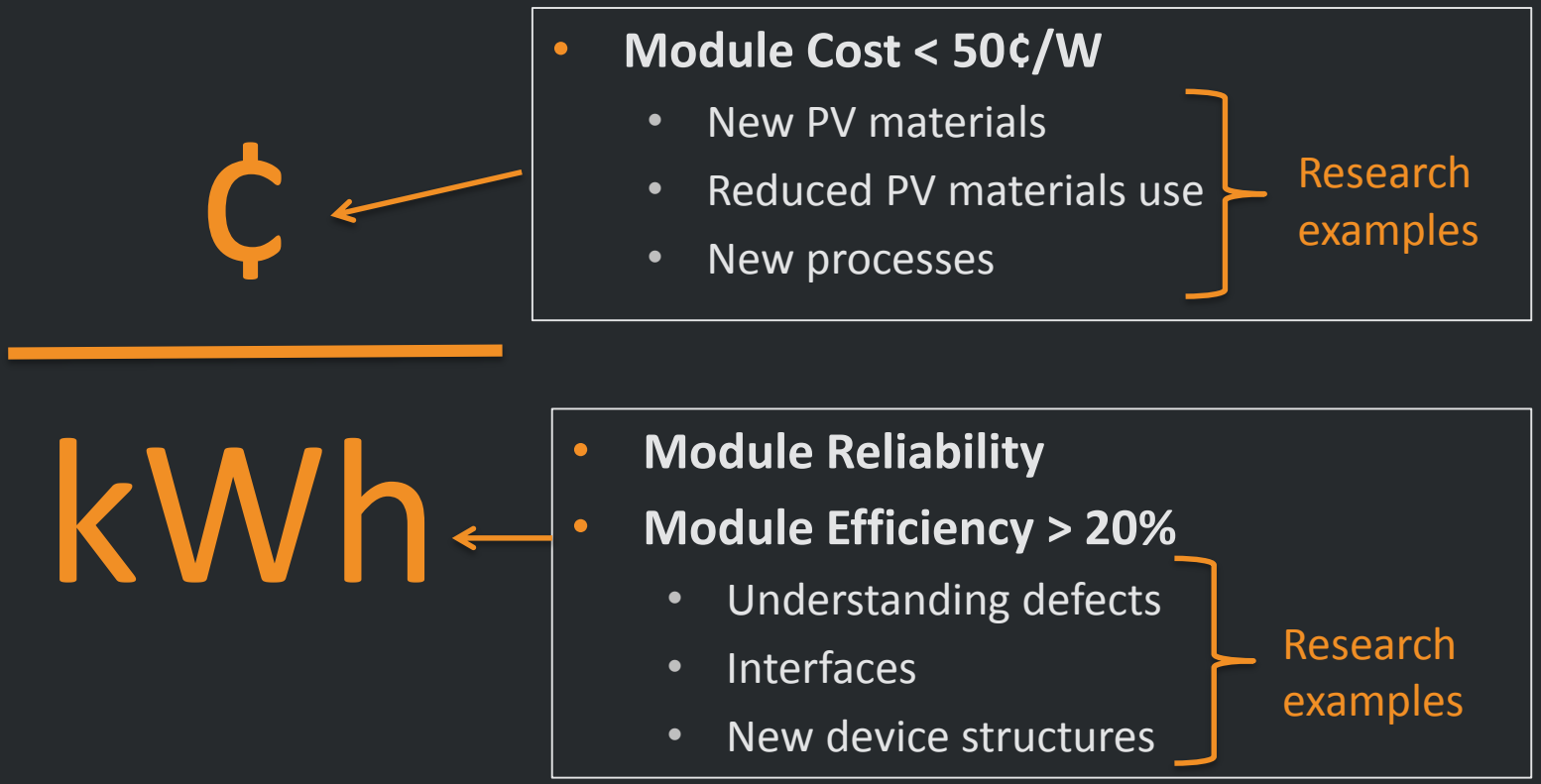
Photovoltaics R&D

Becca Jones-Albertus, Ph.D

Program Manager for PV R&D

Focus of the Photovoltaics R&D Subprogram

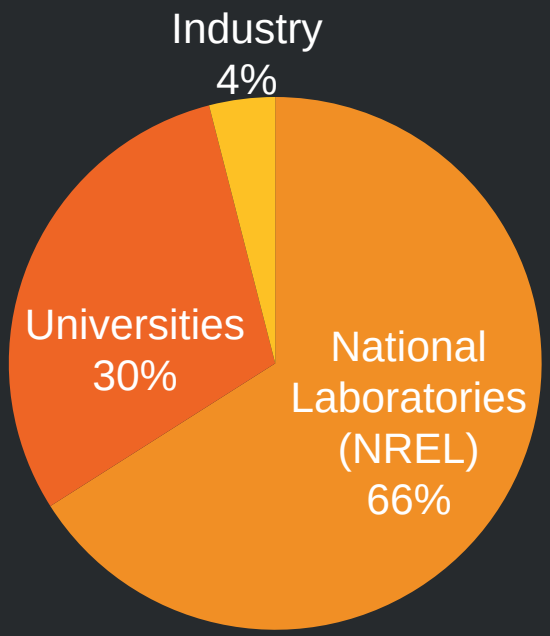
- Reduce the levelized cost of energy (LCOE) through R&D advances in PV cell and module technology



Funding Streams

National Laboratory R&D

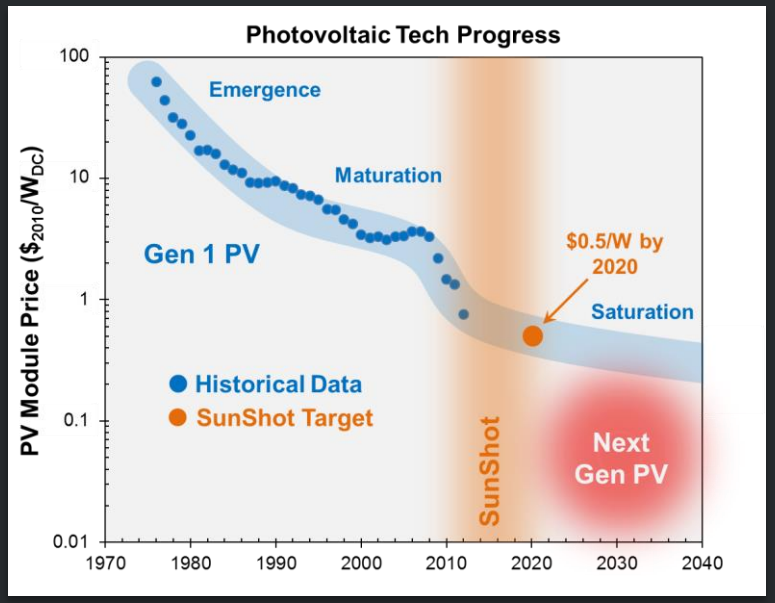
Funding Opportunity Announcements (FOAs)



- Current value of projects in PV R&D Portfolio: $183 million
  - Project durations from 2 - 5 years
  - Funding spans early applied research through development leading to a commercial prototype

Next Generation Photovoltaics

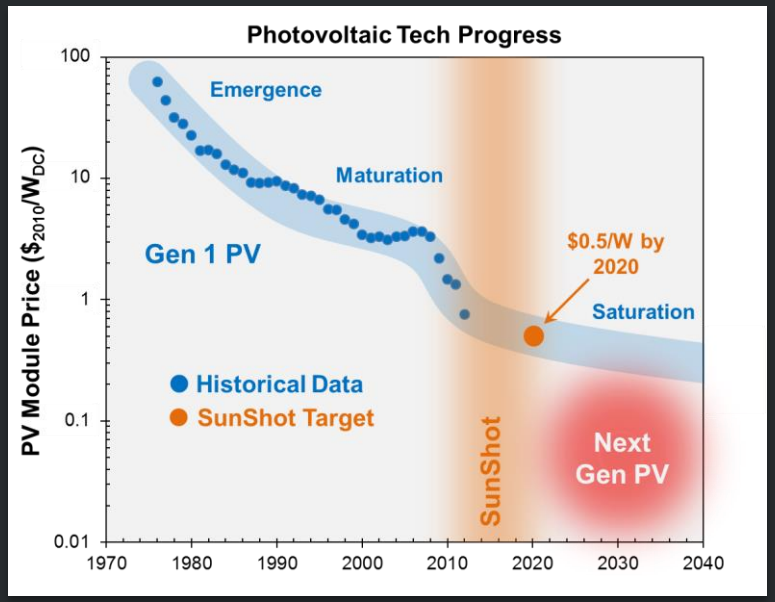
- Applied research on innovative materials and device structures
- Targets significant reductions in LCOE beyond SunShot goals
  - Module price < 50¢/W
  - Module efficiency > 20%
- Core FOA: Next Generation Photovoltaic Technologies
  - 3rd round in review, awards expected this summer (currently in a silent period)



Next Generation Photovoltaics

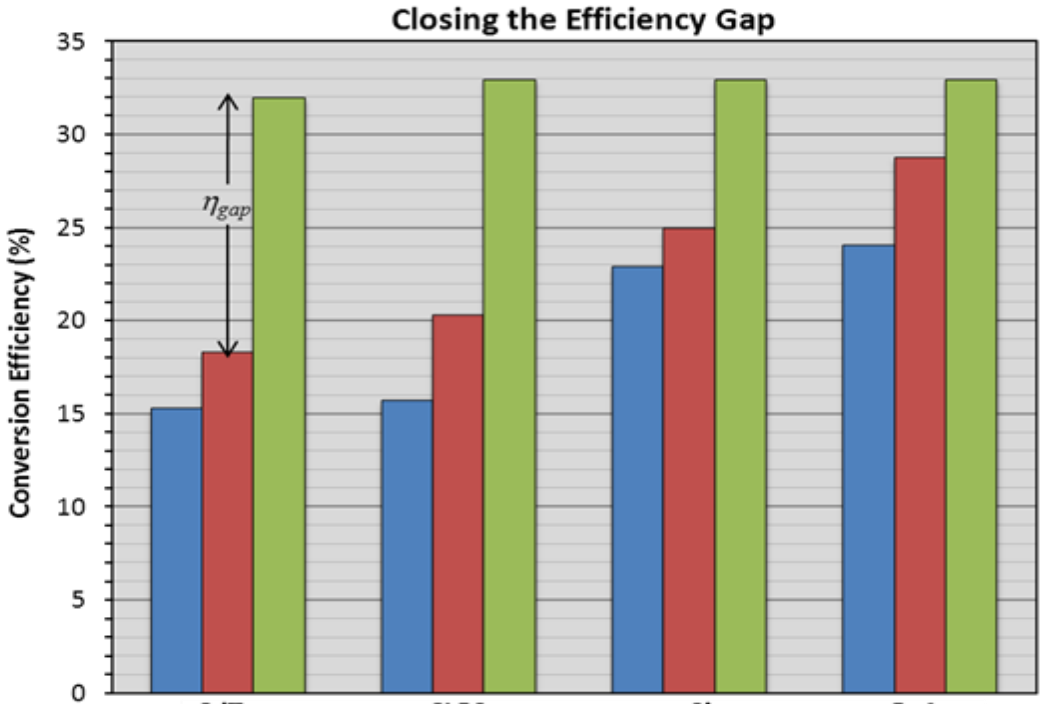
Next Generation 3 Areas of Interest:

- New materials and processes to demonstrate greater than 30% cell efficiency at less than 50x
- New materials and processes that enable LCOE reduction and produce cell efficiencies competitive with incumbent technologies
- Processes and advanced multijunction structures to reduce cell $/cm^2 costs while maintaining efficiency
- Advanced modules



Advancing Photovoltaic Efficiency

- Improving the efficiency and overcoming technological barriers in established solar cell materials
  - Si, CdTe, CIGS and III-Vs



	CdTe	CIGS	c-Si	GaAs
Best Module[1]	15.3 ± 0.5	15.7 ± 0.5	22.9 ± 0.6	24.1 ± 1.0
Best Research Cell[2]	18.3 ± 0.5	20.3 ± 0.6	25.0 ± 0.5	28.8 ± 0.9
Schockley-Queisser Limit[3, 4]	32	33	33	33

Core FOA: Foundational Program to Advance Cell Efficiency (F-PACE)

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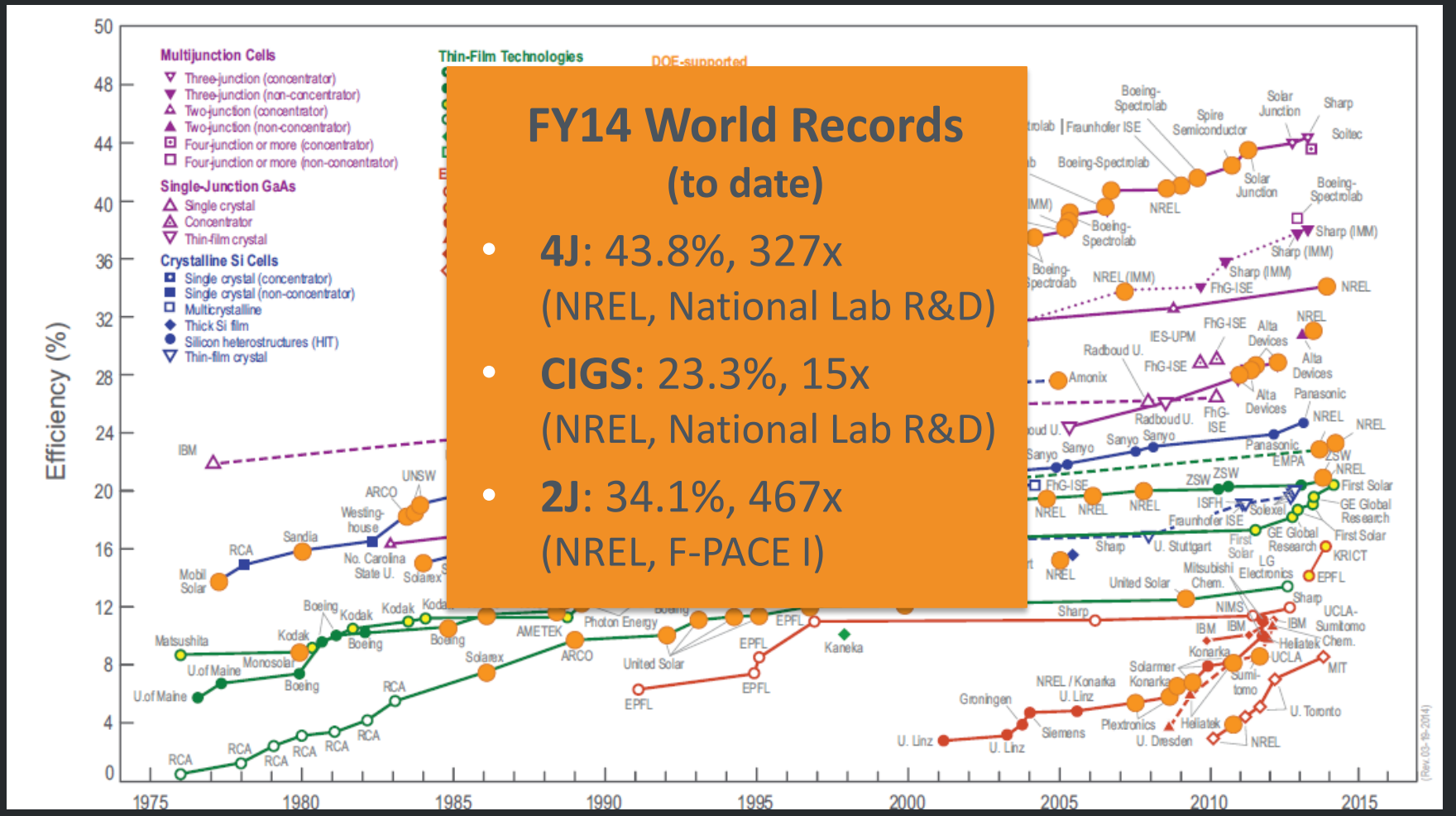
Long History of Impact: Supporting >50% of Records



Underlying chart by Keith Emery, NREL, with National Laboratory R&D funding (April 2014)

National Laboratory R&D at the National Renewable Energy Laboratory's (NREL's) National Center for Photovoltaics (NCPV)

Thin Films	CZTS	CIGS	CdTe
Crystalline Materials	III-V	Si	HVPE
New Materials Development	OPV	Rapid Development of Earth Abundant Materials	TCOs
General Support	Core Support	Director's Initiative & Cap Ex	Partnering & Business Development
Characterization and Test	Cell and Module Performance	Technique Development	

FY13-FY15 Funding: $31.5 M/yr

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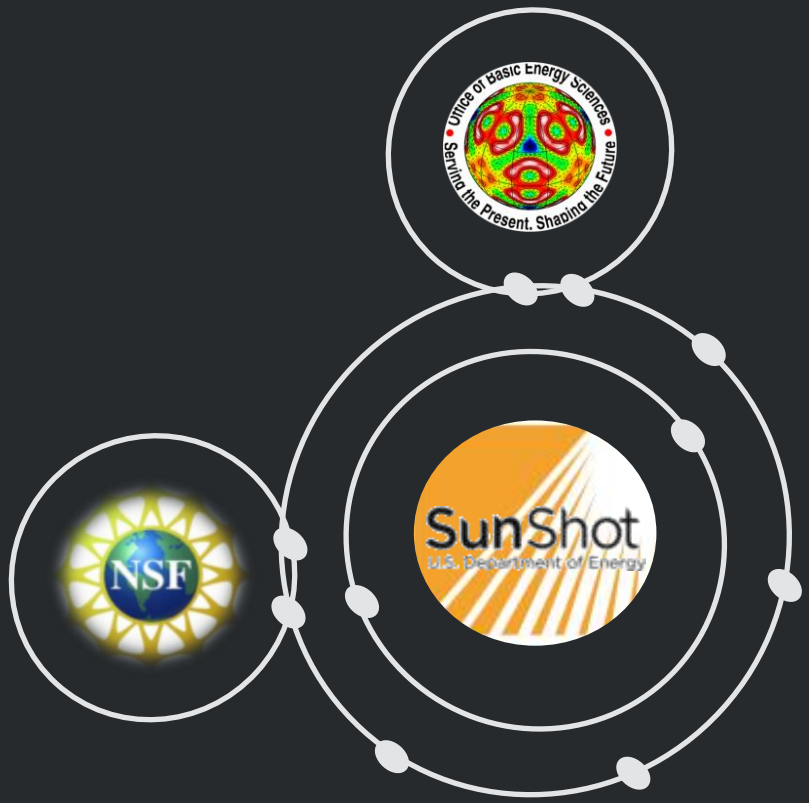
Additional Areas of Investment

- Bridging the gap between basic science and applied PV research (BRIDGE FOA)



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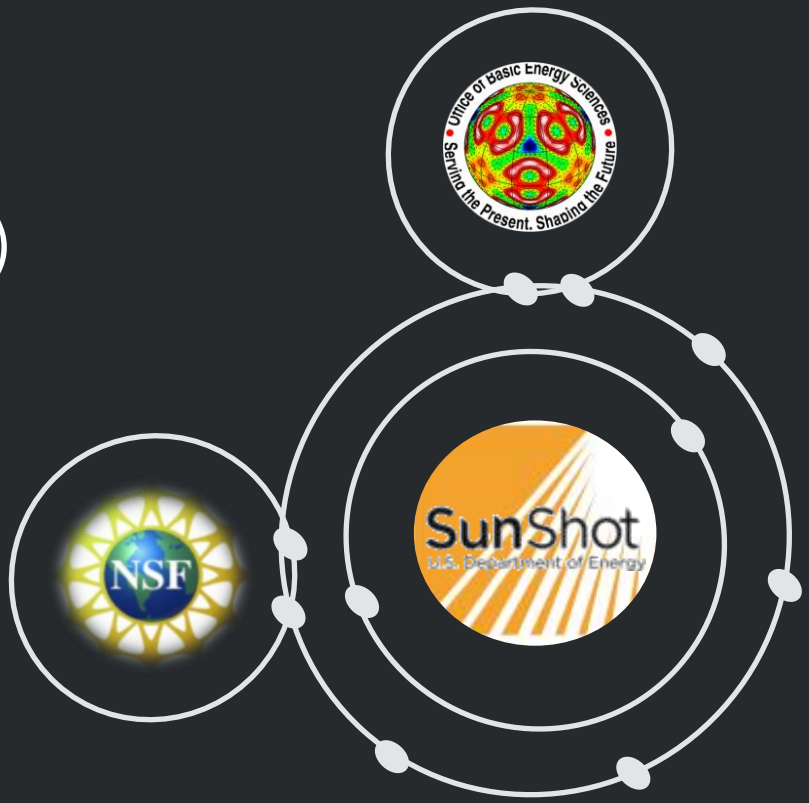

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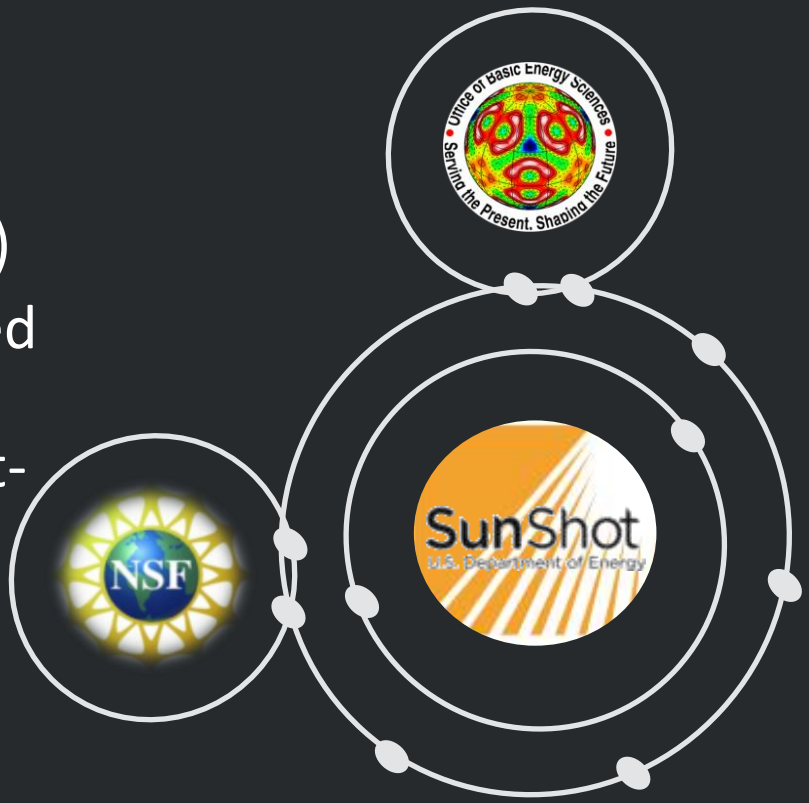

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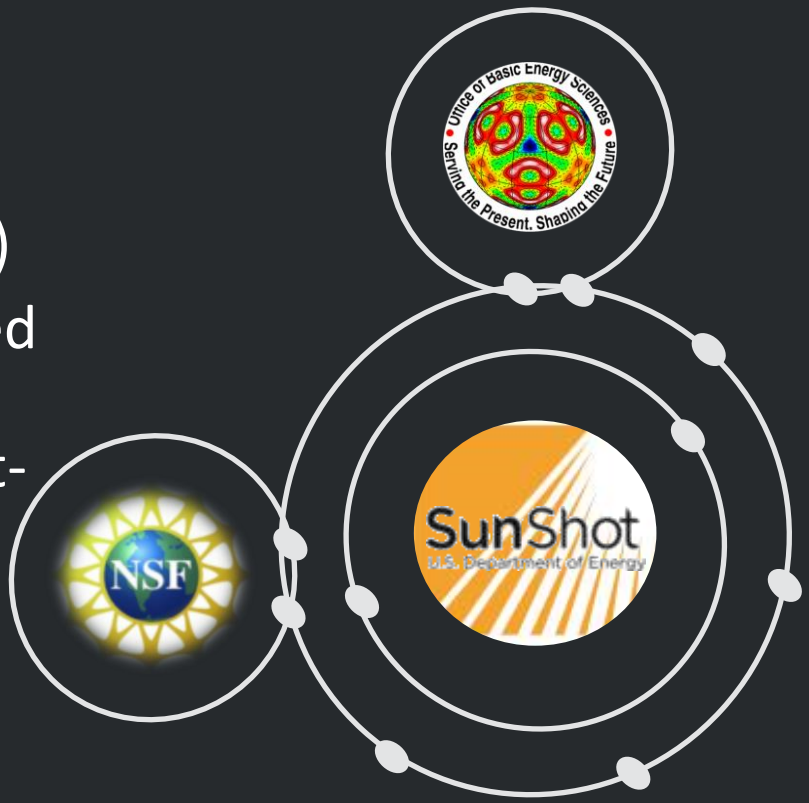

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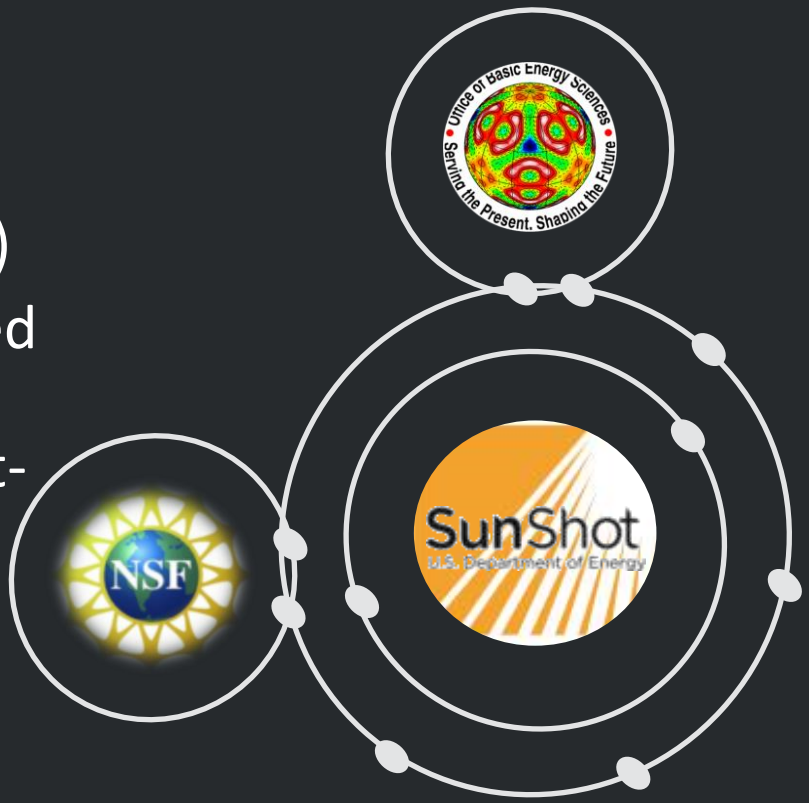
- Solar Energy Research Initiative for India and the U.S. (with DOE Office of Science)



Thank You

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