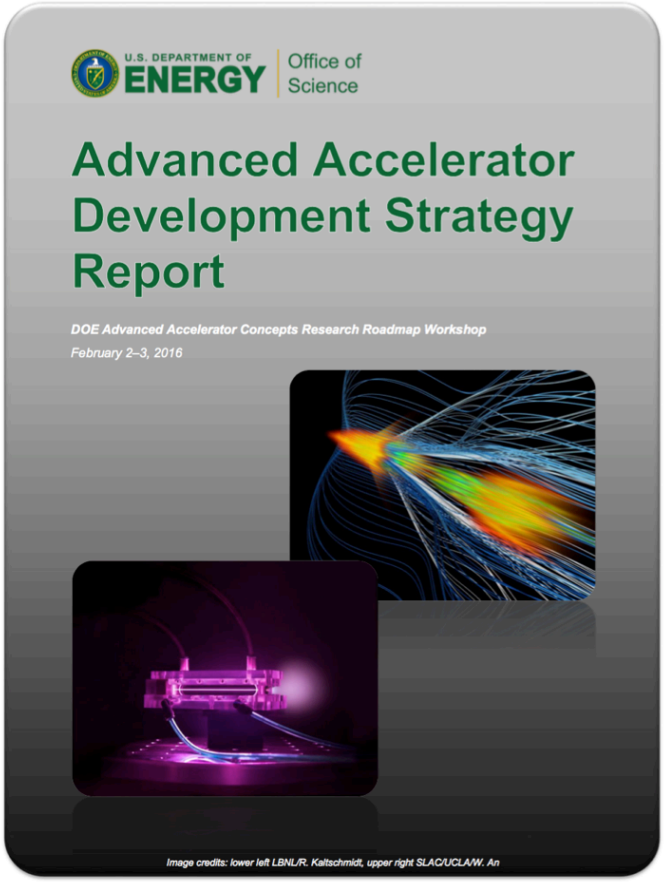
Roadmap for Plasma Wakefield Acceleration
Requires order[s] of magnitude advancement for colliders & photon sources



Strategy for future particle colliders

DOE Office of Science HEP
General Accelerator R&D program

TeV to multi-TeV in 100's of meters
- nC class charge
- 50kHz class rate
- nm emittance
- percent energy spread

Intermediate applications: photon sources for nonproliferation, security, basic science, industry, medicine
- Thomson: keV-MeV
- Betatron: keV
- Free Electron Lasers

GeV-class, ≥ kHz, 10-100pC, µm

Currently	Developing
E: Stable few %	<1%
ΔE: Stable at 10%	<1%
Diverg: ~ mrad	< 0.1mrad
Point: ~ mrad	< 0.1 mrad
Emittance: 0.1 µm	0.01 µm
Charge: ~10 pC	~100pC
Efficiency: few %	~30%
Rate: Hz	≥ kHz
e- only	e-, e+

Scalable: ex. higher charge options
- Long wavelength driver: Q~λ
- Higher intensity