



Managed by Fermi Research Alliance, LLC for the U.S. Department of Energy Office of Science

Fermilab and the National Cosmic Program

Craig Hogan

Fermilab Institutional Review

11 February 2015

FNAL helps shape and support the national program

Fermilab is a crucible of theoretical and experimental ideas

- Leaders in particle astrophysics for >30 years

- Conceived many key ideas and experiments based on them

- Unique cross-training for postdocs: data-rich for theorists and hardware-rich for experimentalists

- FCPA hosts symposia, workshops, collaboration & working group meetings

Scientific and technical leadership in projects and collaborations

- SDSS, CDMS, DES, etc.

Important roles in national strategic planning exercises

- Snowmass, P5, NRC Decadal studies

- They in turn shape our program

National and international recognition

- For Fermilab

 - (e.g. URA universities, international consortia and agreements)

- For Fermilab projects

 - (e.g. broad impact of SDSS as a pathbreaker in big data, precision cosmology)

- For Fermilab scientists

 - (e.g. recently: APS Fellows, AAAS and AAAS Fellows, Early Career, PECASE, Royal Society, IAP Paris Medal, Breakthrough Prize)

Fermilab Astrophysics Plan: alignment with P5

P5 Driver	Experiments
Dark Matter	G1: SuperCDMS Soudan, COUPP/PICO, Darkside, DAMIC G2: SuperCDMS SNOLAB, LZ, ADMX G3: R&D towards advanced WIMP and Axion experiments
Dark Energy/ acceleration	DES, DESI, LSST
CMB/acceleration	SPT-3G, CMB-S4
Detector R&D	R&D on new techniques for particle astrophysics experiments
Astrophysics Theory	Strong coupling with particle astrophysics experiments

FCPA Experimental Leadership (highlighting Wilson Fellows, Early Career awardees)

Experiment	Fermilab roles	Fermilab scientists/ postdocs (Leader)
SuperCDMS	Project/Operations management, Cryogenics/ shielding/electronics, Data analysis/Science	3/1 (Bauer)
COUPP/ PICO	Project/Operations management, Fabrication Data Analysis/Science	3/1 (<i>Sonnenschein</i>)
Darkside 50	LAr expertise, data acquisition	1/1 (Pordes)
DAMIC	CCDs, management,	1/1 (<i>Estrada</i>)
LZ	TPC, process control, science	1/1 (<i>Lippincott, Dahl</i>)
ADMX	Project management, R&D	1/0 (<i>Chou</i>)
DES	Project/operations management, DECAM, Calibration/Science	13/2 (Frieman, Flaugher, Diehl)
DESI	CCD packaging, optics, science	2/0 (Flaugher)
LSST	Dark Energy Science	1/0 (Dodelson)
SPT/CMB	Cryostat assembly, testing, design for S4	2/1 (<i>Benson</i>)
Holometer	Project/operations management, science	2/0 (<i>Chou</i>)