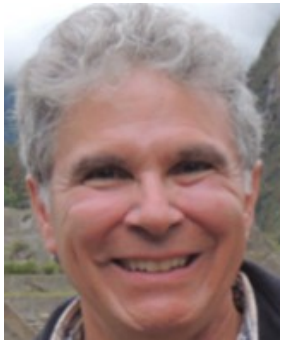
Astronomy and Astrophysics Advisory Committee (AAAC)

Jim Ulvestad
Acting Assistant Director
National Science Foundation
September 27, 2017

Mathematical and Physical Sciences (MPS)

Astronomical Sciences (AST)	Chemistry (CHE)	Materials Research (DMR)	Mathematical Sciences (DMS)	Physics (PHY)
				
Richard Green, DD	**Angela Wilson, DD**	**Linda Sapochak, DD**	**Tie Luo Acting DD**	**Denise Caldwell, DD**

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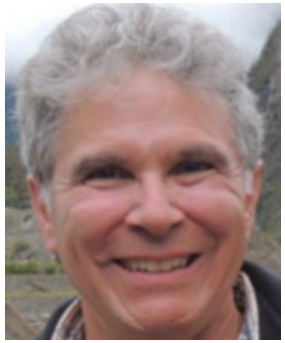
- Astronomical Sciences (AST)
- Chemistry (CHE)
- Materials Research (DMR)
- Mathematical Sciences (DMS)
- Physics (PHY)



Ralph Gaume
DDD

Carol Bessel
DDD

Sean Jones
DDD

Nandini Kannan
Acting DDD

Brad Keister
DDD

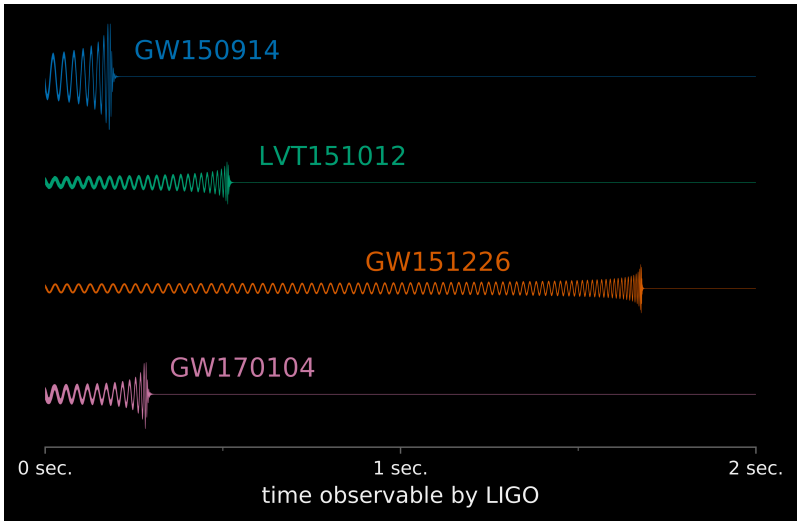
Directorate for Mathematical and Physical Sciences

Office of Assistant Director

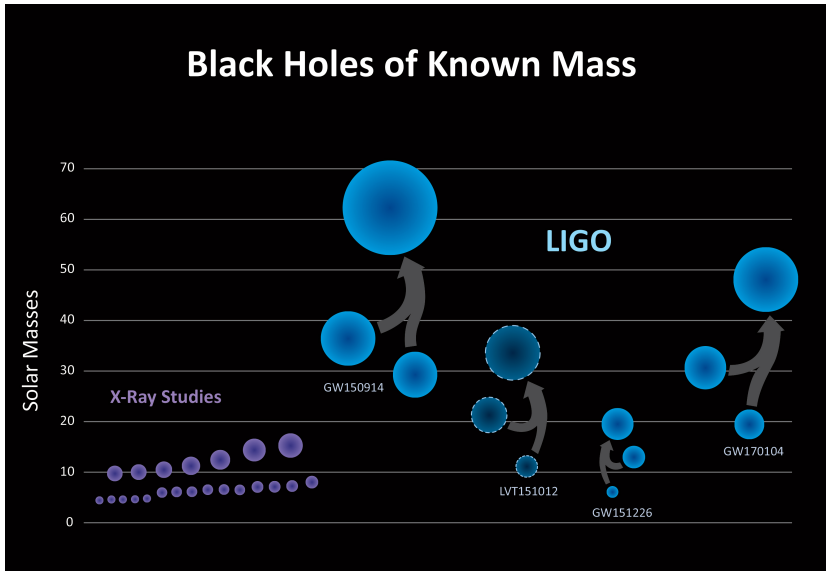
- Jim Ulvestad remains as Acting AD
- Deborah Lockhart continues as Deputy AD
- Wayne van Citters retired as Senior Advisor for Facilities
  - Ad for replacement closed September 8
- Clark Cooper is on detail from Office of Multidisciplinary Activities to Directorate for Engineering

Third Confirmed LIGO Detection GW170104

The newfound black hole, formed by the merger, has a mass about 49 times that of our sun. This fills in a gap between the masses of the two merged black holes detected previously by LIGO, with solar masses of 62 (first detection) and 21 (second detection).



Images: LIGO.org



Original Black Holes Masses: 19 and 31 $M_{\odot}$.
Final Black Hole Mass: 49 $M_{\odot}$
Distance: 880 Mpc (z = 0.18). The farthest detection so far.

Unlike the previous two detections, it is likely that in this merger the BH spins were initially counter aligned with the orbital angular momentum

No evidence of departure from GR.

American Innovation and Competitiveness Act (AICA)

- New Authorization Act for NSF (and NIST), passed by Congress in early January
- No specific funding targets incorporated
- Supports NSF principles of merit review
- Language relating to NSF awards being in the national interest
- Language about facility oversight
- NSF has developed response plan for all specific requirements

FY 2017 Appropriation

- FY 2017 appropriation passed by Congress in early May (with <5 months left in FY 2017)
  - Essentially flat with respect to FY 2016
- NSF FY 2017 spending is complete
- DKIST and LSST construction continued to be fully funded in FY 2017

Upcoming NSB Actions

- February 2018: National Center for Optical and Infrared Astronomy concept approval
- May 2018: LIGO renewal
- May 2018: HL-LHC advancement to final design stage
- July 2018: LSST operations proposal
- TBD: Environmental and transition actions (Arecibo, Green Bank, Sac Peak, CHESS)

Agency Reorganization & Reform

- Initial hiring freeze, January-April 2017
- OMB memo M-17-22 (April 12)
  - Comprehensive Plan for Reforming the Federal Government and Reducing the Federal Civilian Workforce
- Agency Steering Committee, town halls
- Preliminary Agency Reform Plan due June 30
- More detailed plan will be in FY 2019 budget request

NSF FY 2018
Budget Request

Total: $6.65 billion

Continued Investment in NSF Research Infrastructure

NSF's 10 Big Ideas

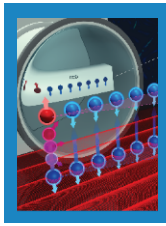
RESEARCH IDEAS

Harnessing Data for 21st Century Science and Engineering

Work at the Human-Technology Frontier: Shaping the Future

Navigating the New Arctic

Windows on the Universe: The Era of Multi-messenger Astrophysics



The Quantum Leap: Leading the Next Quantum Revolution

the Rules of Life: Predicting Phenotype

PROCESS IDEAS

Mid-scale Research Infrastructure

NSF 2026

Growing Convergence Research at NSF

NSF INCLUDES: Enhancing STEM through Diversity and Inclusion

NSF Principles Applied for FY 2018 Request

- Continue to fund all S&E disciplines
- Support early career
- Protect the core
- Roll back “accretions” (programs scaled up substantially since 2008)
- Cross disciplinary programs are important
- Strategic and prioritized reductions within directorates

MPS in FY 2018 Request

MPS Funding

(Dollars in Millions)

	FY 2016 Actual	FY 2017 Estimate	FY 2018 Request	Change Over FY 2016 Actual Amount	Change Over FY 2016 Actual Percent
Astronomical Sciences (AST)	$246.63	246.16	$221.15	-$25.48	-10.3%
Chemistry (CHE)	246.52	245.74	221.05	-25.47	-10.3%
Materials Research (DMR)	309.88	314.31	282.87	-27.01	-8.7%
Mathematical Sciences (DMS)	233.95	233.51	209.78	-24.17	-10.3%
Physics (PHY)	276.91	281.38	253.30	-23.61	-8.5%
Office of Multidisciplinary Activities (OMA)	34.89	34.93	31.28	-3.61	-10.3%
Total	**$1,348.78**	**$1,356.03**	**$1,219.43**	**-$129.35**	**-9.6%**

- Slight DMR and PHY increases in FY 2017 caused by hosting of new NSF Science and Technology Centers

NSF Principles Applied to MPS

- Support early career
  - CAREER request kept relatively stable. Targeted REU reductions if undergraduate students could be supported through national facilities and normal research awards. 8,000 graduate students to be supported through MPS research awards.
- Protect the core; cross disciplinary programs
  - Major research facilities are “core” to MPS.
  - Reduced dedicated funds to cross-disciplinary programs.
  - Rolled cross-disciplinary efforts into existing grants programs to retain flexibility to fund the best science.
- Strategic and prioritized reductions within directorates
  - Highest priority facilities fully funded; small reductions to a few facilities in transition.
  - Reduced mid-scale and instrumentation; support individual investigators.
  - Prioritized programs leading to “Big Ideas”.

FY 2018 Appropriation Status

- Congress has passed a Continuing Resolution through December 8, at approximately FY 2017 funding levels
- Note: Budget Control Act (aka "sequester") still in effect
- Appropriations Subcommittee Bills (in $M):

Line	FY16 Actual	FY17 Enacted	FY 18 Request	House	Senate
NSF	7,494	7,472	6,653	7,339	7,311
R&RA	5,998	6,034	5,362	6,034	5,918
EHR	884	880	761	880	862
MREFC	242	209	183	78	183
AOAM	351	330	329	329	329
NSB	4	4	4	4	4
OIG	15	15	15	15	15