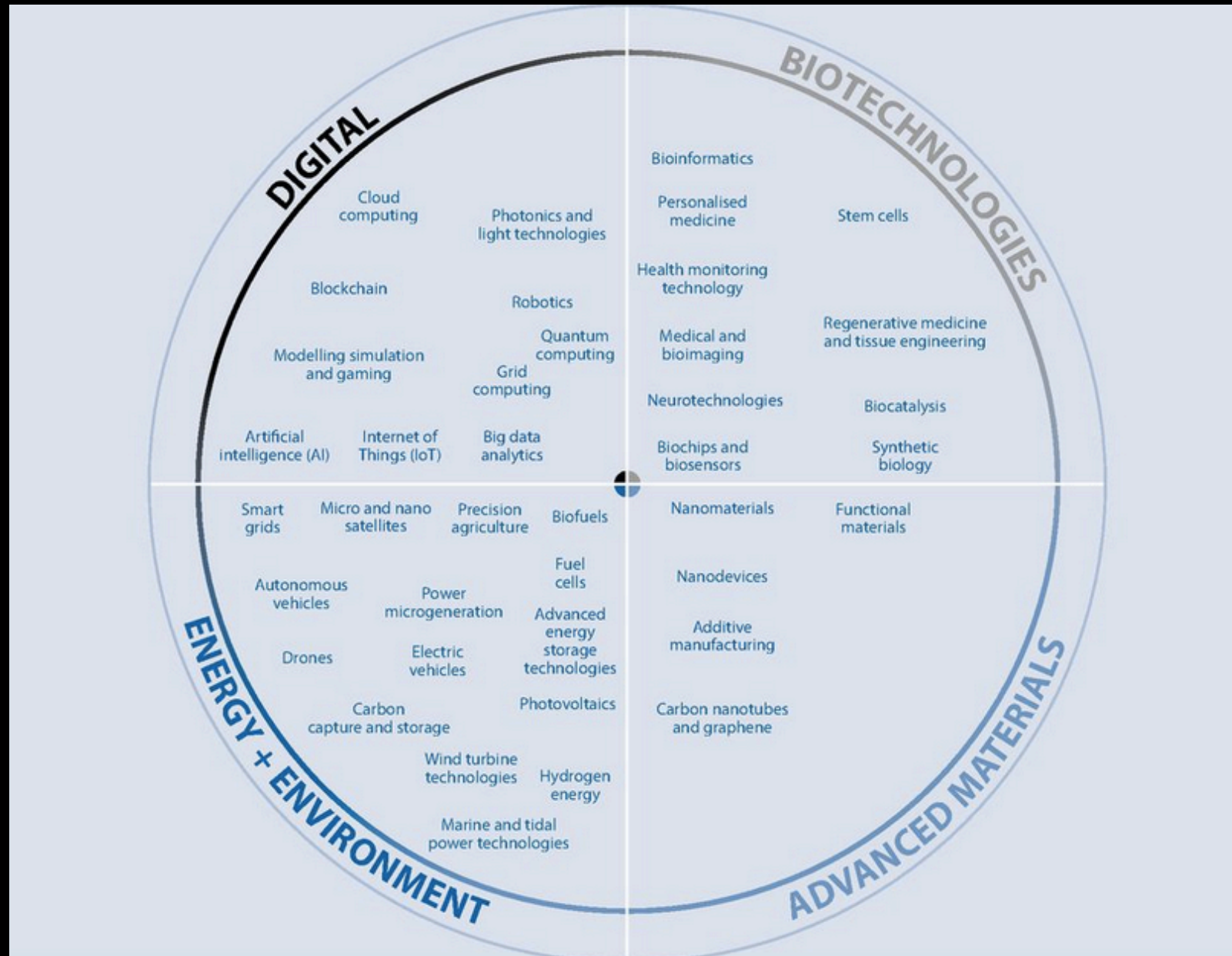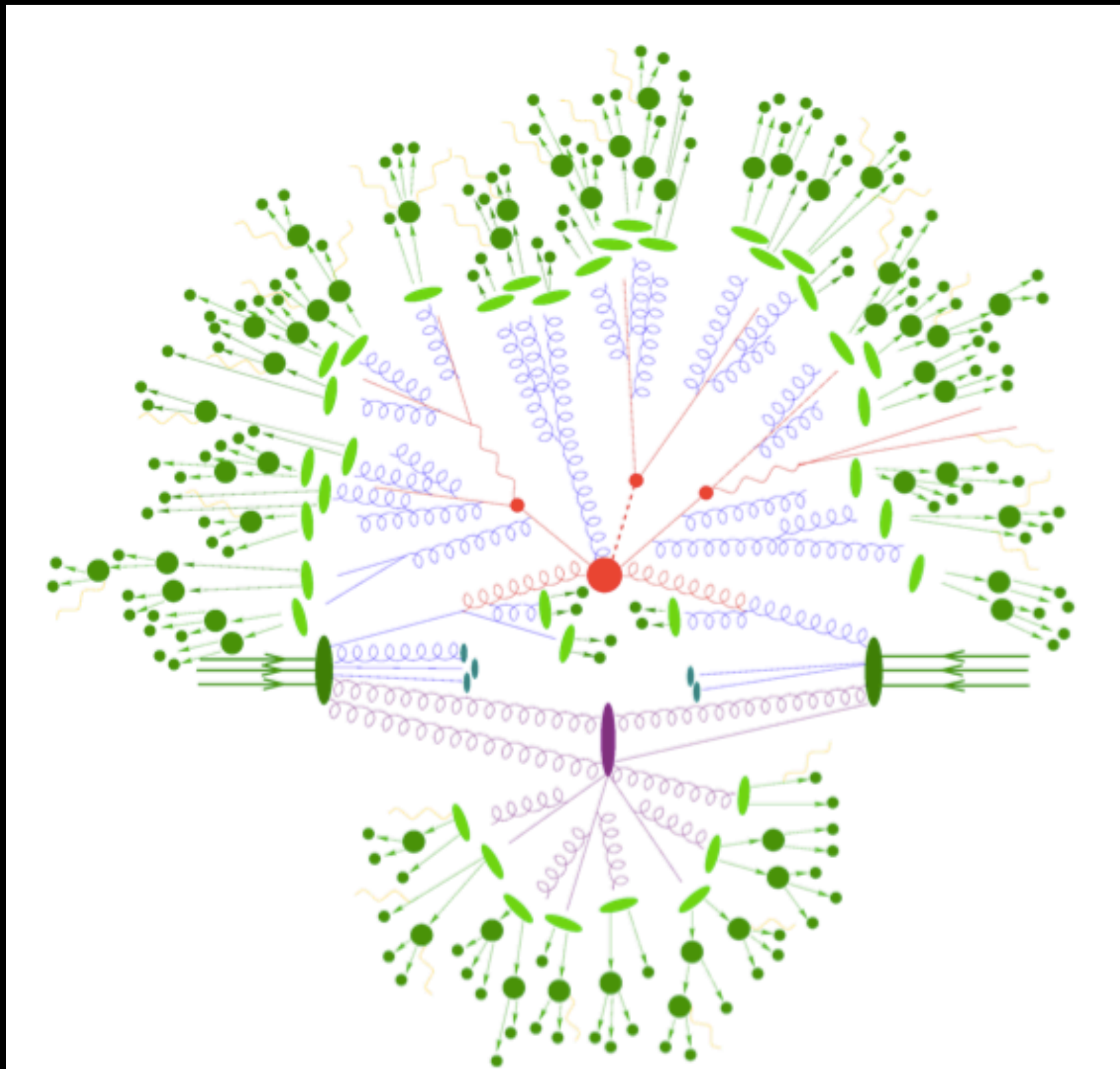# Open Science Grid: A Year in Review

Rob Quick - OSG Operations
Pervasive Technology Institute - Indiana University

- Musings

- Events of Importance

- Education and Outreach

- OSG Area Successes

- More musings

40 Key and Emerging Technologies for the Future

Organisation for Economic Co-operation and Development (OECD)

The International Union of Pure and Applied Physics (IUPAP) awarded a 2016 Young Scientist Prize in Particles and Fields to Stefan Höche
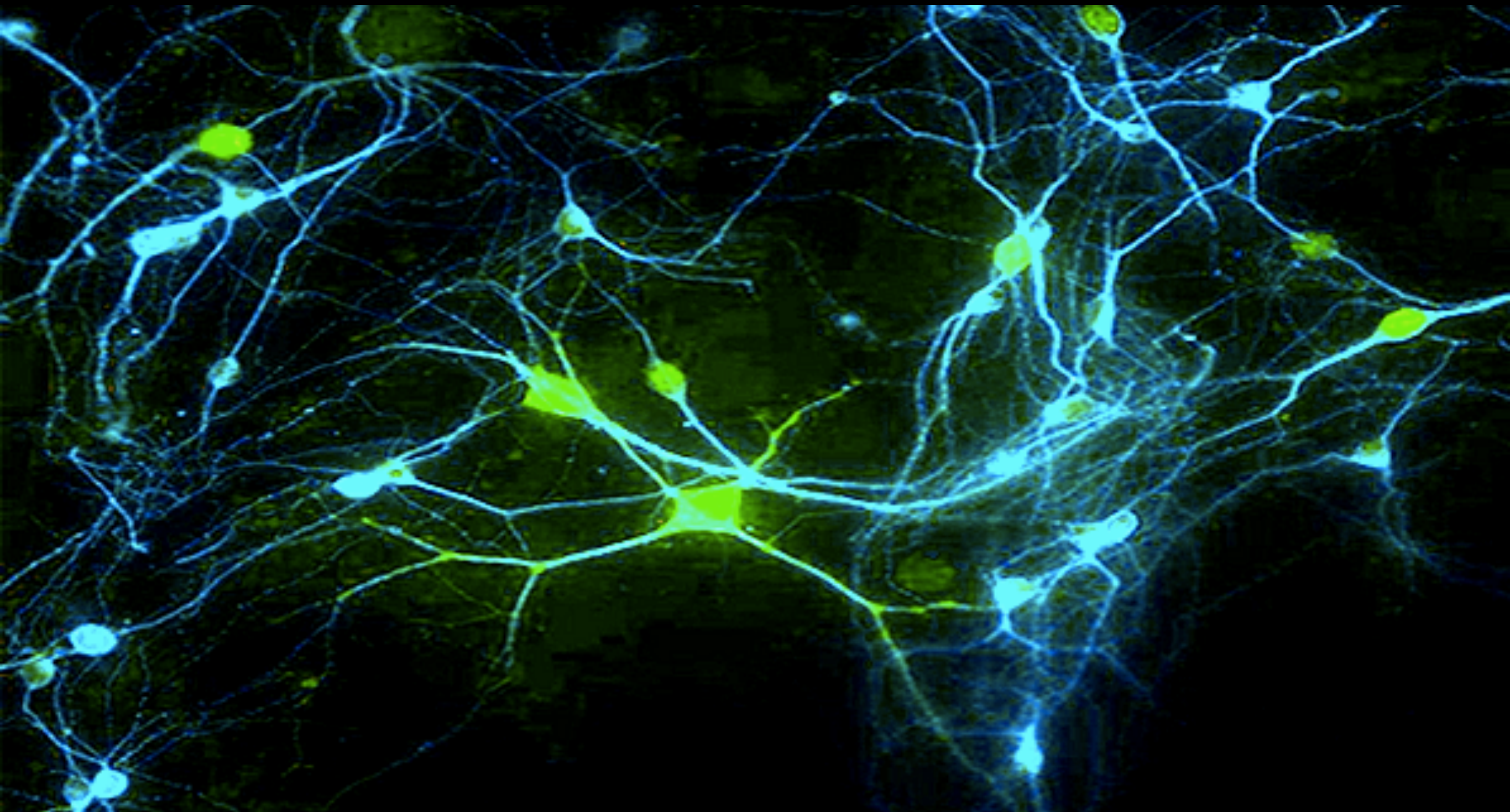
"Once we had access to the computational resources of the OSG, we saw a paradigm shift in the way we think about research," said Cox. "Previously, we might have jobs running for months. With HTC on the OSG, that job length became just a few days. It gave new legs to the whole research program and pushed us forward on new optimization techniques that we never would have tried otherwise."

"In particular in the case of dynamic games, OSG could become a crucial tool, making the difference between being able to do something and not."

-Fernando Luco

Education and Outreach

OSG Summer School

- July 25-29, Madison Wisconsin

- Over 50 participants from around the world

- 7th annual school and the largest to date

- AHM Speakers who previously attended Summer Schools

  - Fernando Luco - TAMU - Economics

  - Scott Cole - UCSD - Neuroscience

  - Jiang Shu - UNL - Bioiformatics

CODATA/RDA School of Research Data Science

- Two week Data Science school at ICTP in Trieste, Italy

- ~70 students from Low and Middle Income Countries

- Inaugural instance August 2016

- 2017 two instances in Trieste, July and Sao Paulo, December

- Students learned core Data Science Concepts, Data Management, Neural Networks and Machine Learning, and using International Cyberinfrastuctures

- Heavily leveraged OSG-Connect

- 2 active students (bioinformatics and climate modeling)

African School of Fundamental Physics and its Applications

- Three week physics school in sub-Saharan Africa

- 80 Students from Africa and the Middle East

- Started in 2010 in South Africa

  - Subsequent schools in Ghana, Senegal, and Rwanda

  - Next instance summer 2018 Namibia

- Students learn general DHTC concepts via lectures and exercises.

Highlights by Functional Area

- Communication - Kyle Gross

- Networking - Shawn McKee

- Operations - Rob Quick

- Production Support - Ken Herner

- Release - Tim Theisen

- Security - Susan Sons

- Software - Brian Lin

- Technology - Brian Bockelman

- User Support - Rob Gardner

Communication

- Several high profile Science Highlights

  - AMS, LIGO, HPCWire Award, IUPAP Young Scientist Prize

- Split into separate area from Operations

  - And more importantly given specific effort

- Twitter and website getting additional attention

Networking

- Continuous collection and Stewardship of all Network Metrics from our Global OSG/WLCG perfSONAR deployment

    - Quick identification and resolution of network problems

- Development of the new Mesh-Configuration Admin GUI

    - Allows campuses and VOs to manage their perfSONAR infrastructure(s)

- Successful prototyping of network analytics using the U of Chicago Analytics Platform based on ELK and Jupiter

    - Extract useful understand about complex network problems

    - Continuous analysis allows creation of a table of network "alarms"

    - Testing alerting via email; Users can subscribe to relevant alarms

Operations

"Another flaw in the human character is that everybody wants to build, and nobody wants to do maintenance." -Kurt Vonnegut

- 30+ EL 5 Services moved to EL 6/7

- Implemented Ansible configuration management system

- BDII - Ready to be turned down

- AAI research (Away from x509 authentication)

- OASIS service stabilization

Production Support

- AMS on OSG

- Successful setup of BOSCO-CE at Stanford (and now others)

- CMS on Stampede

- FIFE on EGI sites

- ATLAS and CMS opportunistic usage

Release

- Consistent roll out of monthly releases

  - Find and fix defects before the release

  - No high priority out of band releases

  - Testing HTCondor pre-releases

    - Help identify problem prior to release

    - Have time to adjust to HTCondor changes that affect the OSG Software Stack

- Added data releases for VO Client and CA Certificates

  - Not coupled to software release schedule for quick deployment

Security

- Year 5 Risk Assessment

- SwA assessments on OSG delivered software (with some Ops and SWAMP effort)

- Increased Automation of Security Team processes

Software

- End of support for GRAM

- HTCondor-CE Hardening

- EL 7 Support

  - End of 3.2 software series - End of EL 5 support

- SELinux Support

- Koji upgrade and move

Technology

- Beginning development and rollout of GRACC and Singularity

- Maturing capabilities of HTCondor-CE and StashCache

- End-of-Life for Bestman2/SRM, GIP/BDII, glexec, GRAM

User Support

- Deployed distributed data management services for the Xenon1T dark matter search experiment

  - Linked storage at Gran Sasso Lab, Europe, US and Israel

  - Uniform job submission environment transparently linking campuses, OSG, EGI and SDSC Comet

- Design, procurement and deployment of the online data analysis system for third generation South Pole Telescope (SPT-3G) and offline analysis and simulation environment

  - Link institutional archival storage and computer resources with OSG

- Pioneered the Hosted CE approach

  - OSG managed campus HPC integration solution with minimal site requirements

  - Success at Stanford and Oklahoma State

The sum of these many successes
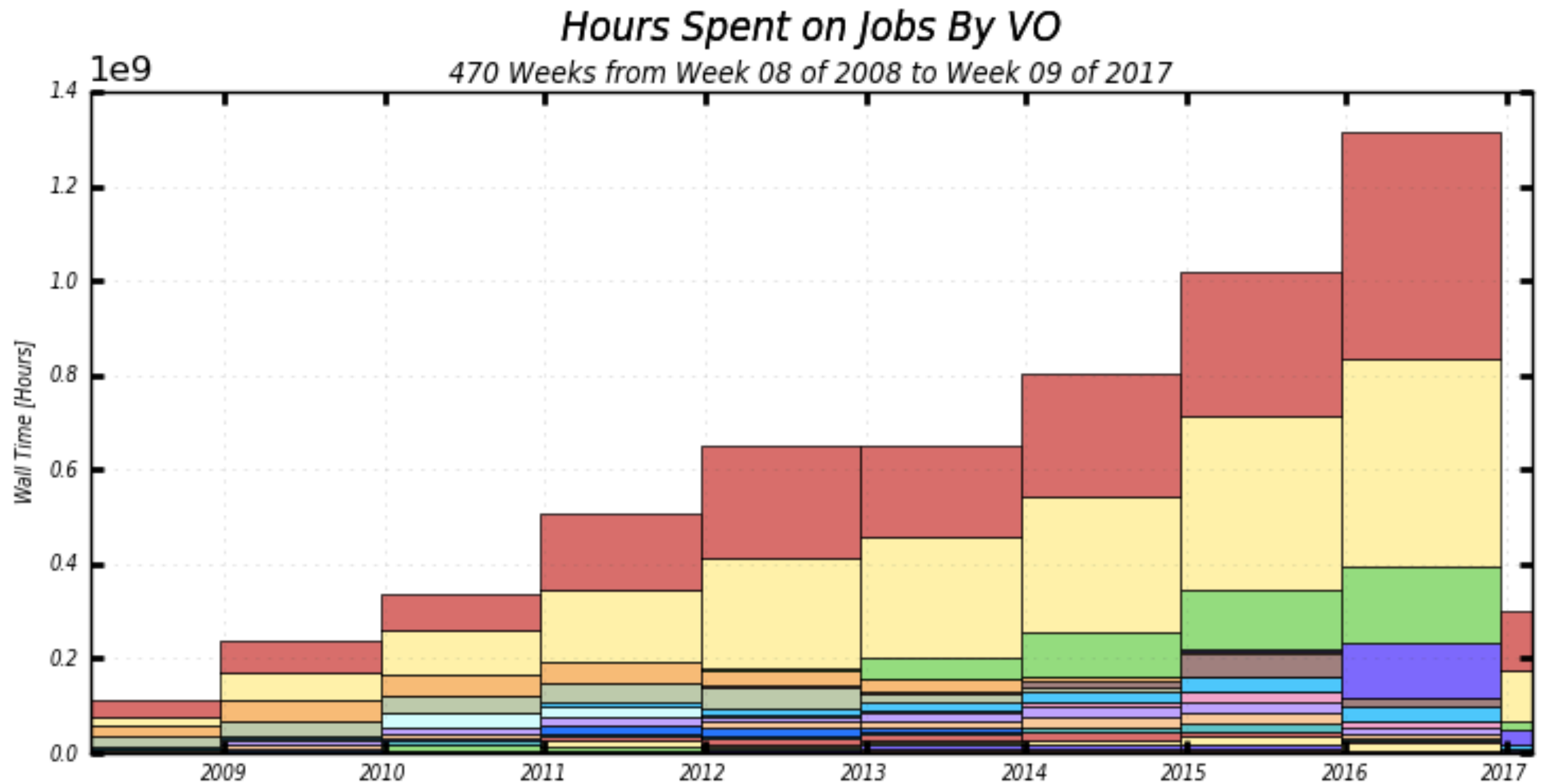
Hours Spent on Jobs By VO
470 Weeks from Week 08 of 2008 to Week 09 of 2017

INTERNATIONAL WOMEN'S DAY | MARCH 8

"The future of every community lies in capturing the passion, imagination, and resources of its people."

–*Ernesto Sirolli*