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Title: LANL Collaboration with UC Campuses. Publications, UC Fee, Postdocs and Students.

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LANL Collaboration with UC Campuses. Publications, UC Fee, Postdocs and Students.

Science Resource Office Peer Review and Metrics

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and promote world stability

April 2019

NNSA National Nuclear Security Administration

UC and LANL Publication Collaborations, 2000 - 2018

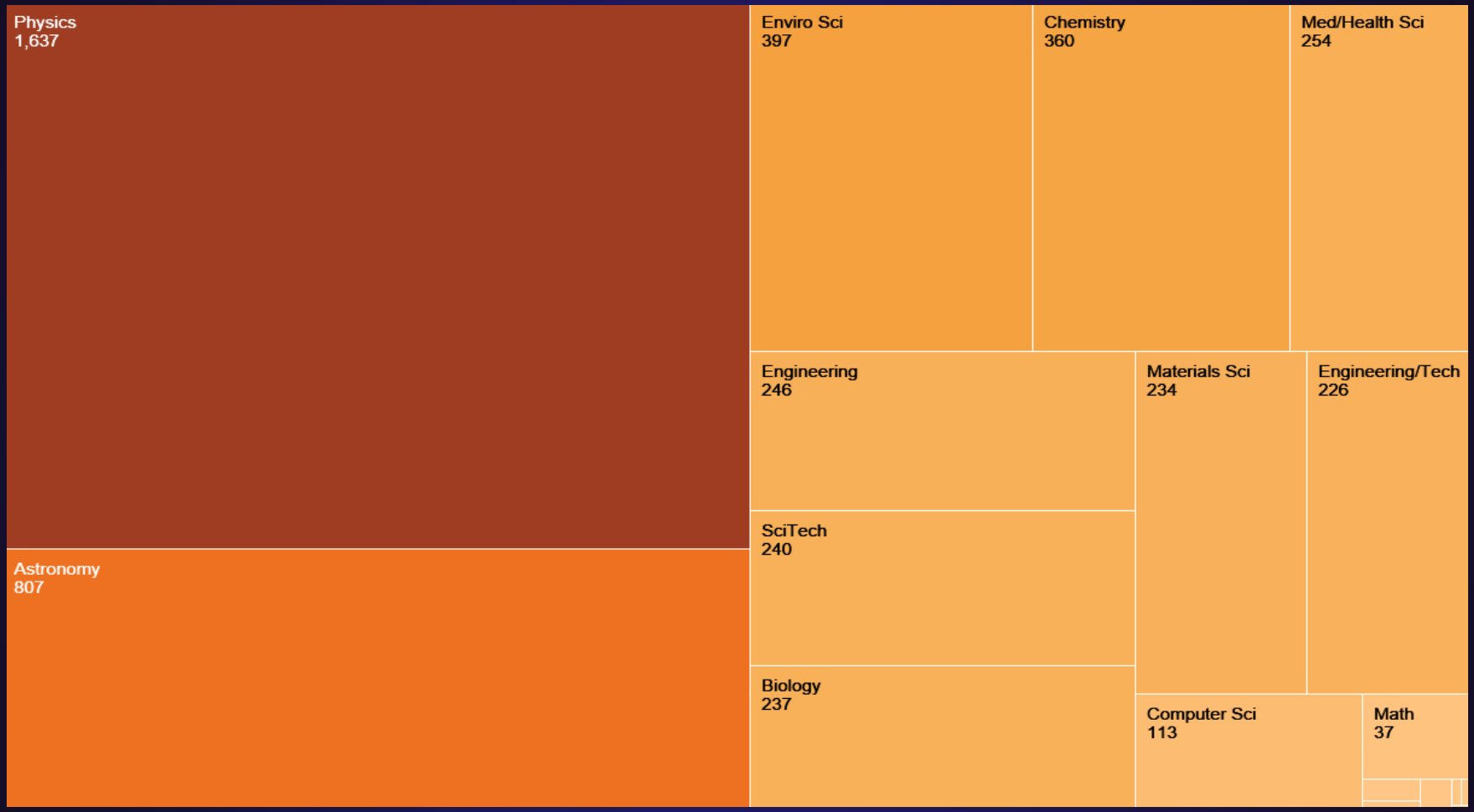
Data and Visualizations

- Web of Science data on joint publications between Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Lawrence Berkeley National Laboratory, and the University of California campuses by research areas over time.

- Visualizations include a Sankey diagram, which provides temporal information, and a Cord-Bipartite diagram, which allows detailed analysis of a given time period.

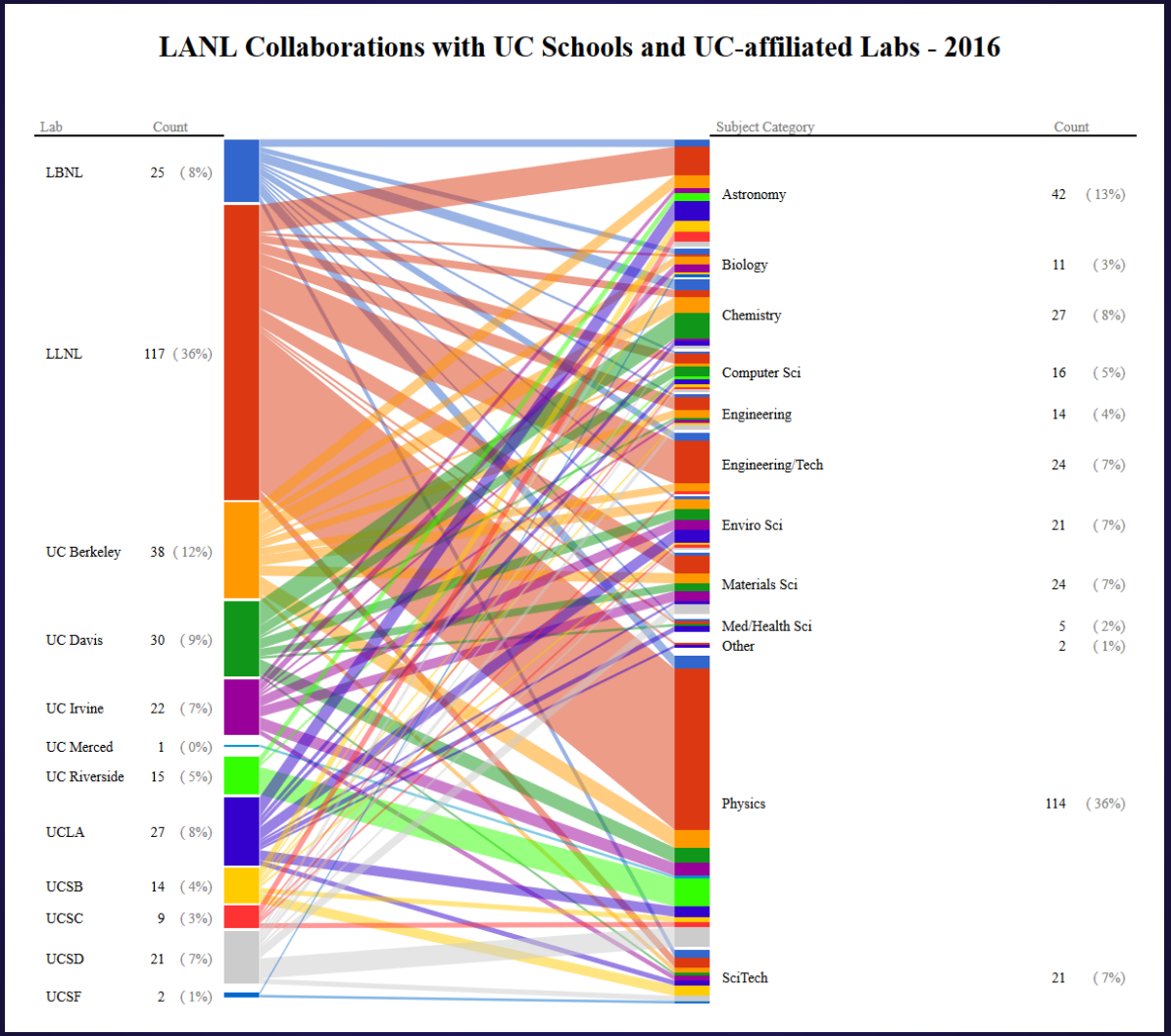
- Designed to facilitate assessment of the role of LANL in the research environment and to provide insight into various connections and influence of LANL within the UC R&D environment.

Subject Areas



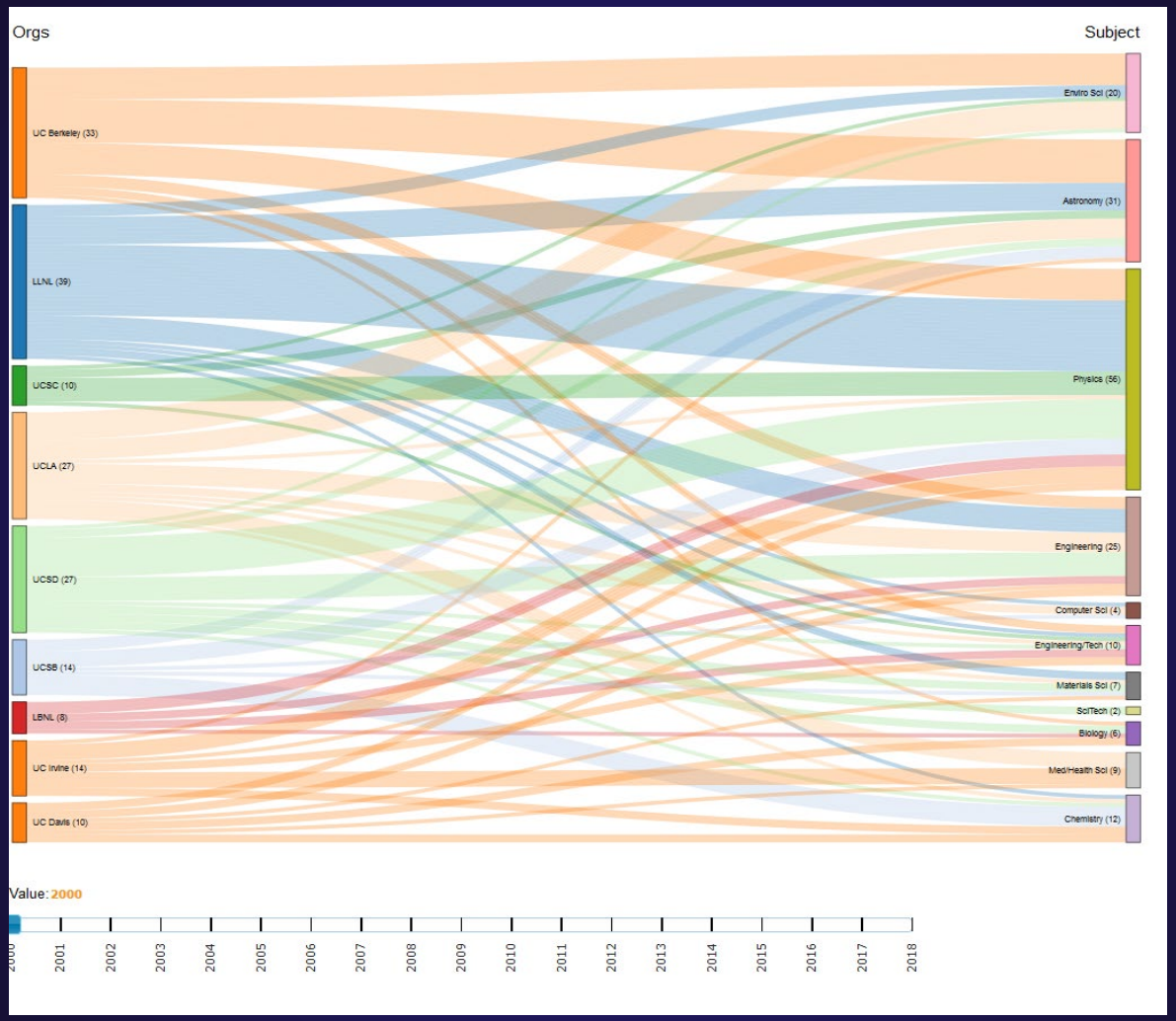
To explore subject areas by UC campus please use the interactive tools

Subject Areas by Campus (interactive)



To explore subject areas by UC campus please use the interactive tools

Subject Areas by Campus and Year (interactive)



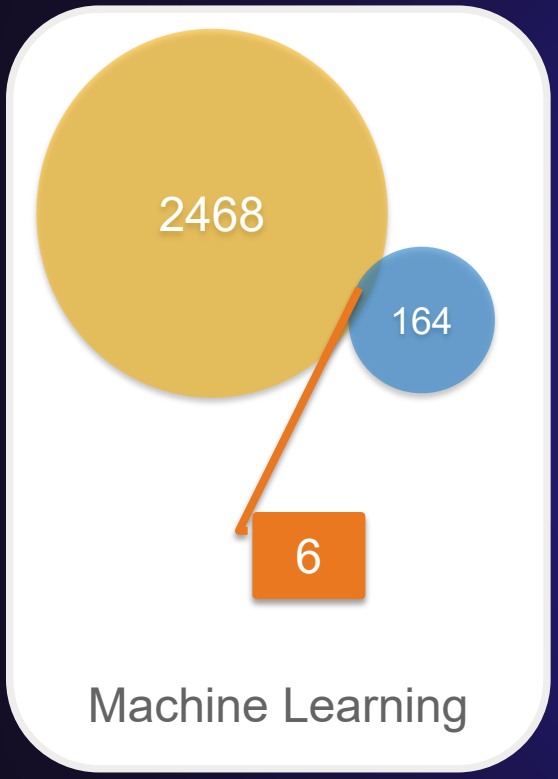
To explore subject areas by UC campus please use the interactive tools

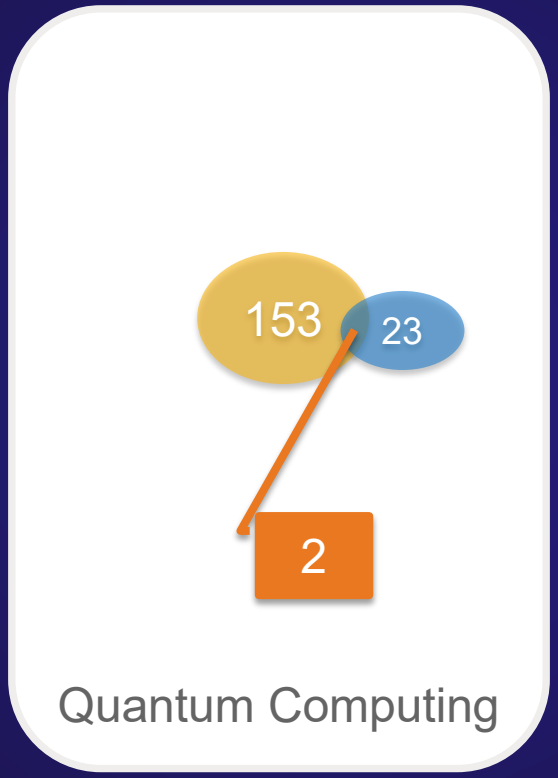
LANL & UC Publication Collaborations by Targeted Subject Areas

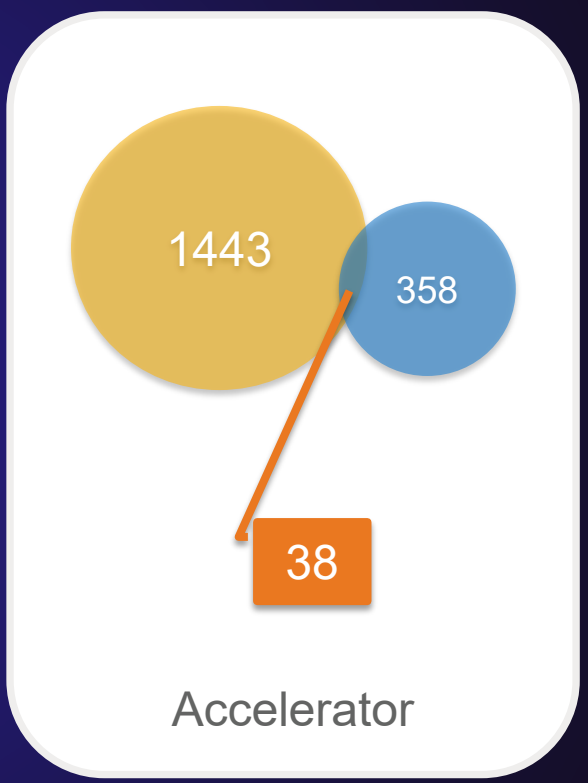
Collaboration between UC Campuses and Los Alamos National Laboratory with a focus on targeted subject areas:

- Machine Learning
- Quantum Computing
- Accelerators

Phrase-based Search revealed fairly low levels of collaboration on these topics







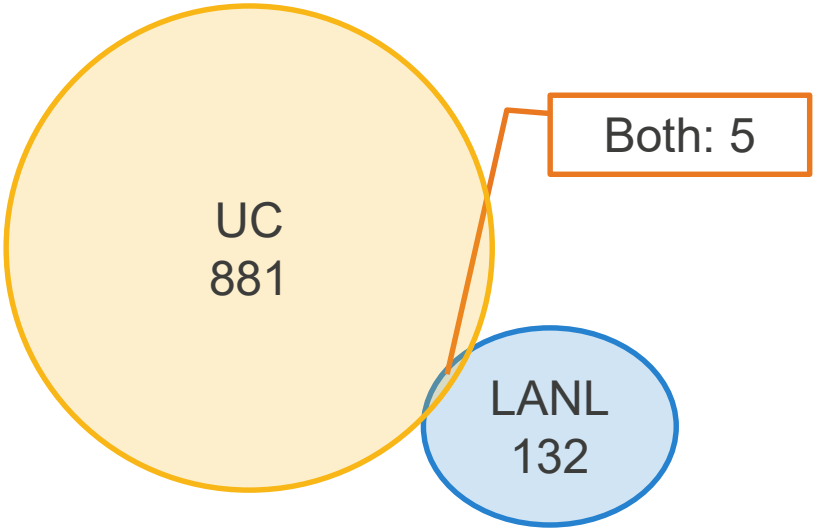
Data Source: Scopus
Time Period: 2008-present
Search Terms in quotes

Alternative Approach: SciVal Topic Analysis

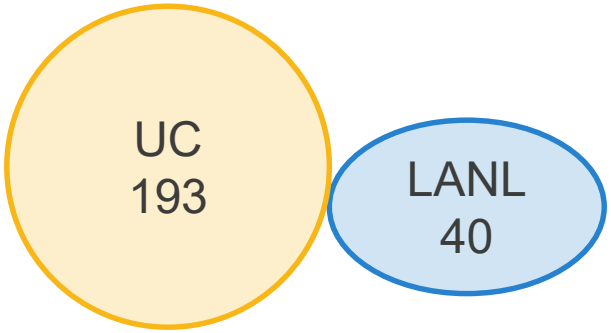
- Topics are based on analysis of citation relationships
- Topic names are drawn from frequent terms in titles and abstracts
- Only recent data is covered (2013 forward)
- There are >97,000 topics grouped into <2,000 topic clusters
- To target **Quantum Computing** we analyzed 2 topic areas:
  - Quantum Optics; Quantum Computers; Quantum Theory
  - Solitons; Waves; Nonlinear Equations
- Time period 2013 to most recent data indexed

Quantum Computing

Quantum Optics; Quantum Computers; Quantum Theory



Solitons; Waves; Nonlinear Equations



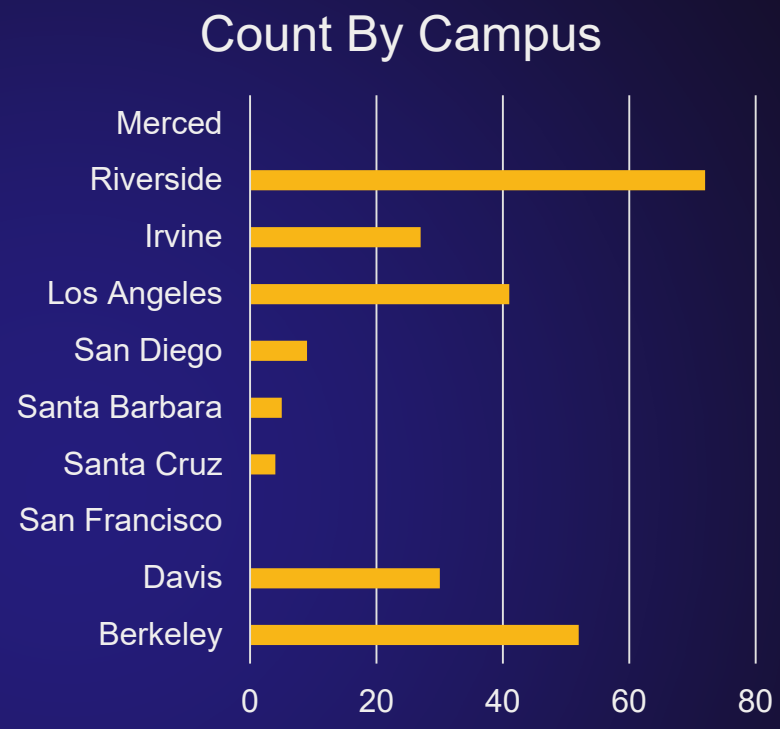
No overlap

What topics are well represented in collaborations between LANL and UC Campuse?

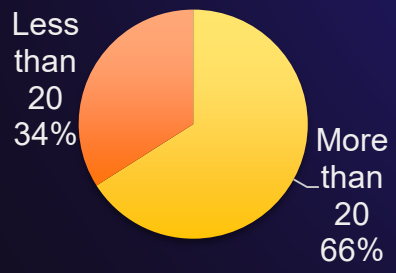
- **Strategy:** bottom-up analysis of publications with LANL and UC authors. Focus is solely on publications with **both LANL and UC authors**
- **Data Source:** Scopus/SciVal data covering 2013 – present
- Analysis of top topic clusters by number of papers published
- Each of the following slides focuses on a single topic and shows
  - Primary LANL groups involved
  - A count of publications by UC Campus
  - Pie chart depicting the prevalence of large collaborations in the data
  - Count of publications by

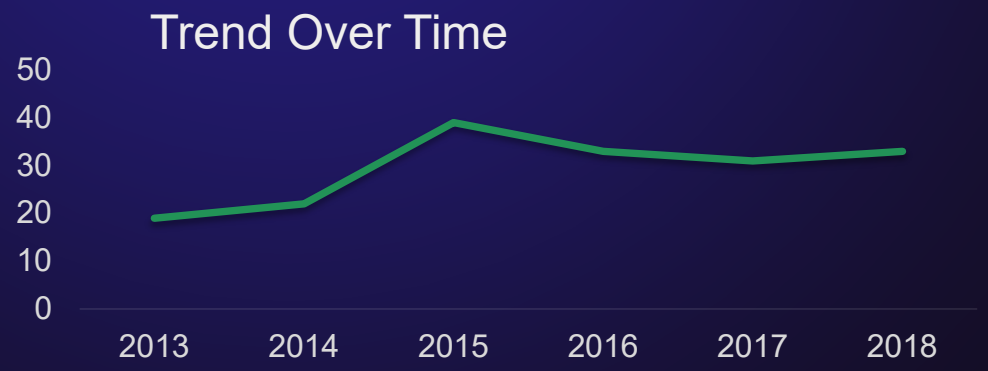
Particle Physics ("Decay, Quarks, Neutrinos")

Primary LANL Groups
SUBATOMIC PHYSICS
NUC & PARTICLE PHYS, ASTROPHYS & COSMOL
XTD PRIMARY PHYSICS
NEUTRON SCIENCE & TECHNOLOGY
PLASMA PHYSICS
MONTE CARLO CODES



Number of Institutions

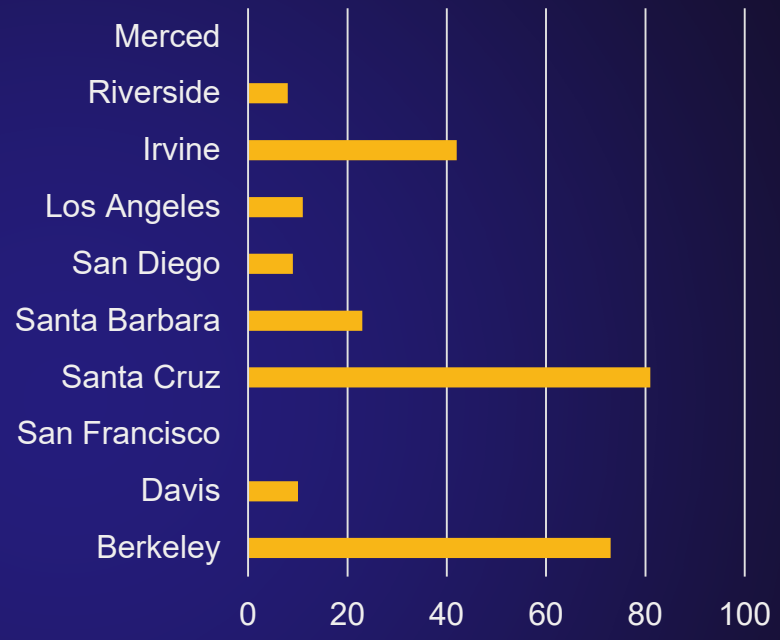




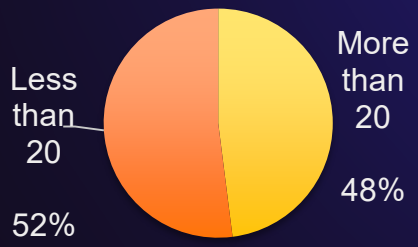
Astronomy ("Galaxies, Stars, Planets")

Primary LANL Groups
SPACE AND REMOTE SENSING
NEUTRON SCIENCE & TECHNOLOGY
COMPUTATIONAL PHYSICS AND METHODS
XTD INTEGRATED DESIGN & ASSESSMENT
NUC & PARTICLE PHYS, ASTROPHYS & COSMOL
EXPERIMENTAL PHYSICAL SCIENCES

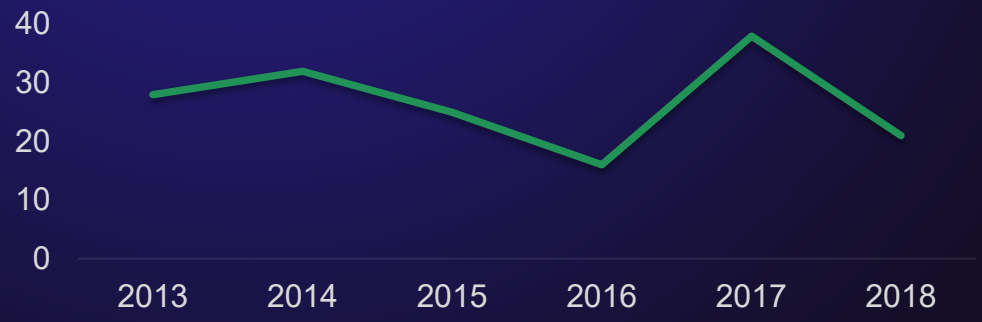
Count By Campus



Number of Institutions



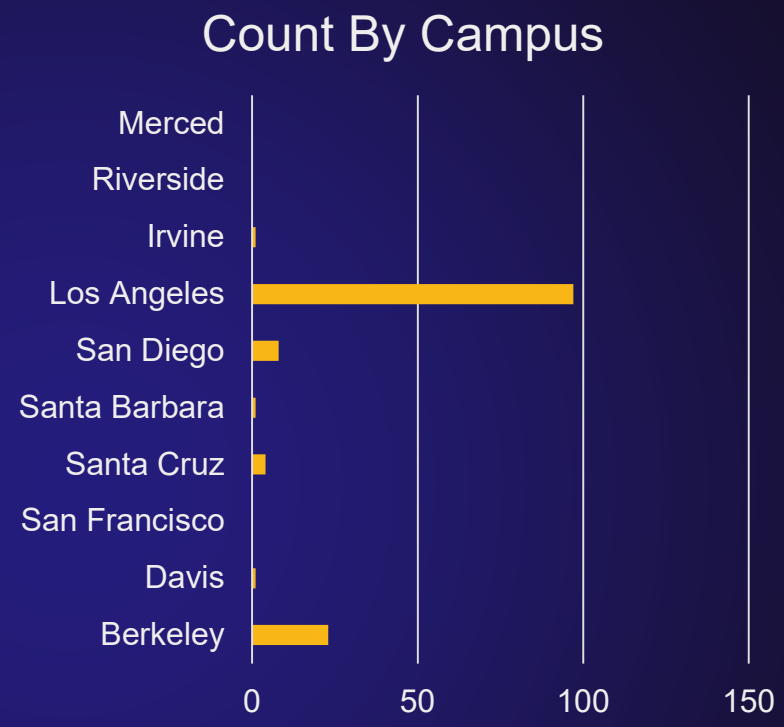
Trend Over Time

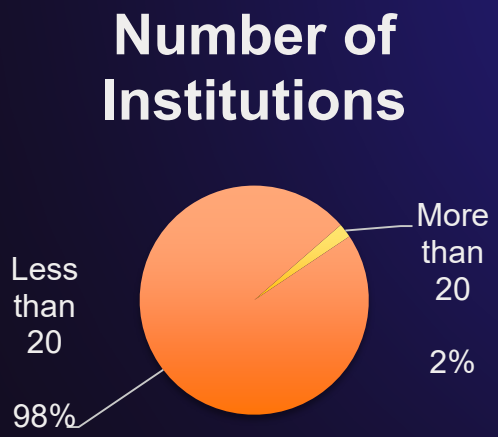


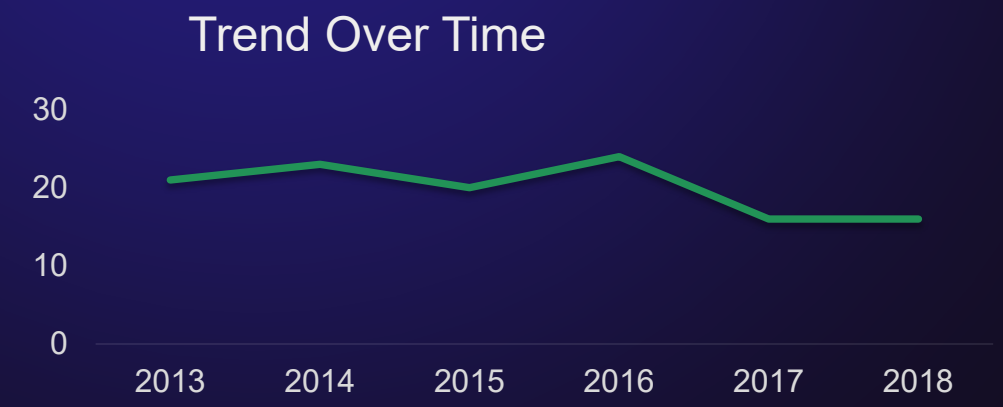
Earth Space Sensing ("Magnetic Fields, Ionospheres, Sunspots")

Primary LANL Groups
SPACE SCIENCE & APPLICATIONS
PLASMA THEORY AND APPLICATIONS
INTELLIGENCE & SPACE RESEARCH

Primary LANL author: Geoff Reeves

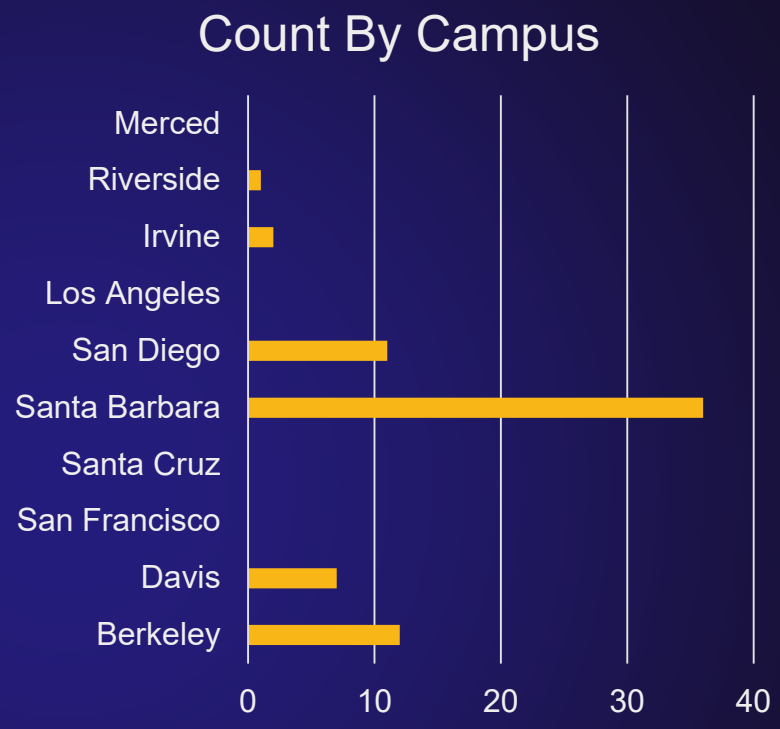




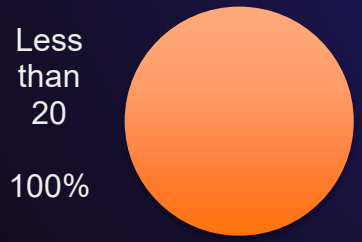


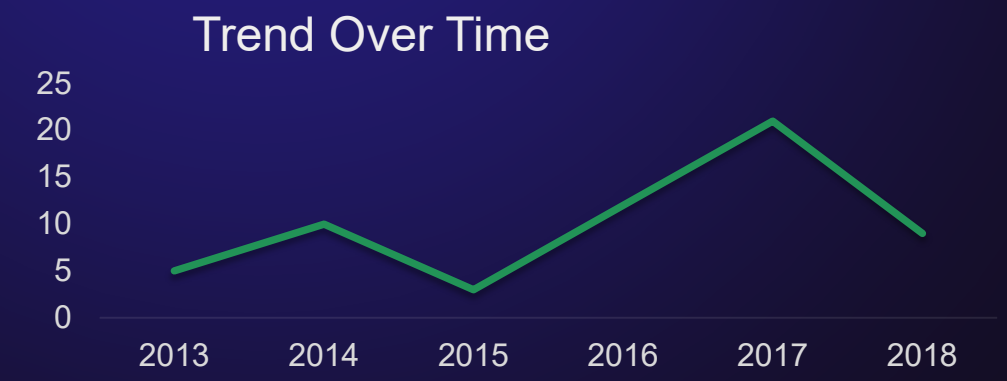
Material Science ("Microstructure, Steel, Austenite")

Primary LANL Groups
MATERIALS SCIENCE IN RADIATION & DYNAMICS EXTREMES
CENTER FOR INTEGRATED NANOTECHNOLOGIES
FLUID DYNAMICS AND SOLID MECHANICS
MANUFACTURING SCIENCE
PHYSICS AND CHEMISTRY OF MATERIALS



Number of Institutions



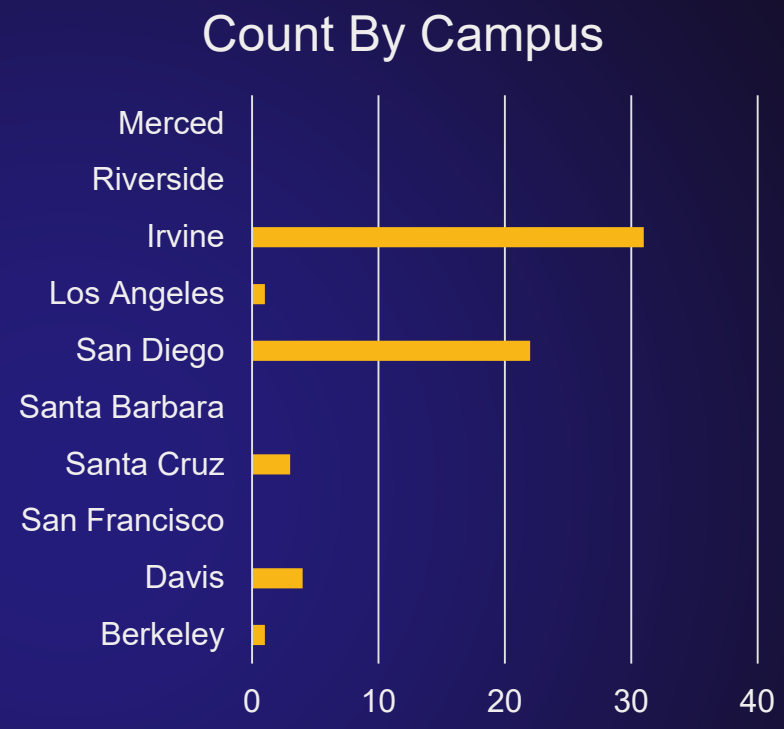


Material Science ("Magnetocaloric Effects, Intermetallics, Specific Heat")

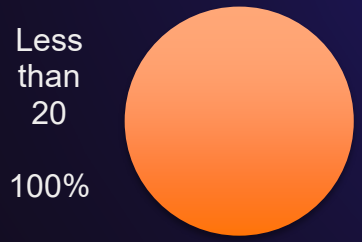
Primary LANL Groups

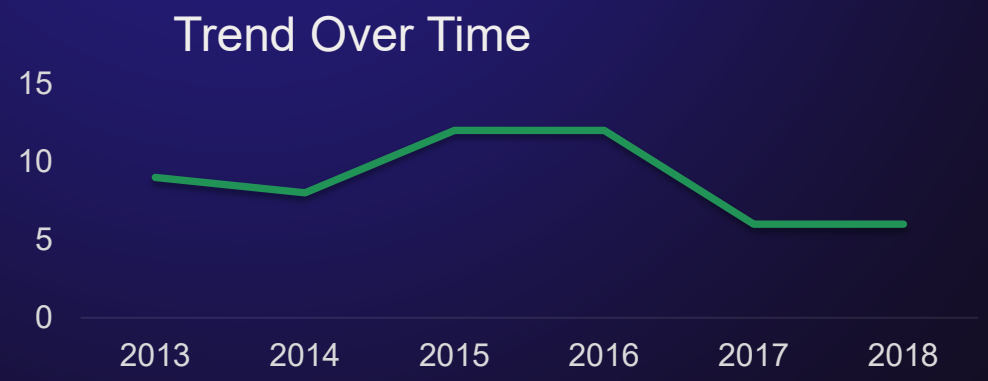
CONDENSED MATTER & MAGNET SCIENCE

MATERIALS SCIENCE IN RADIATION & DYNAMICS EXTREMES



Number of Institutions





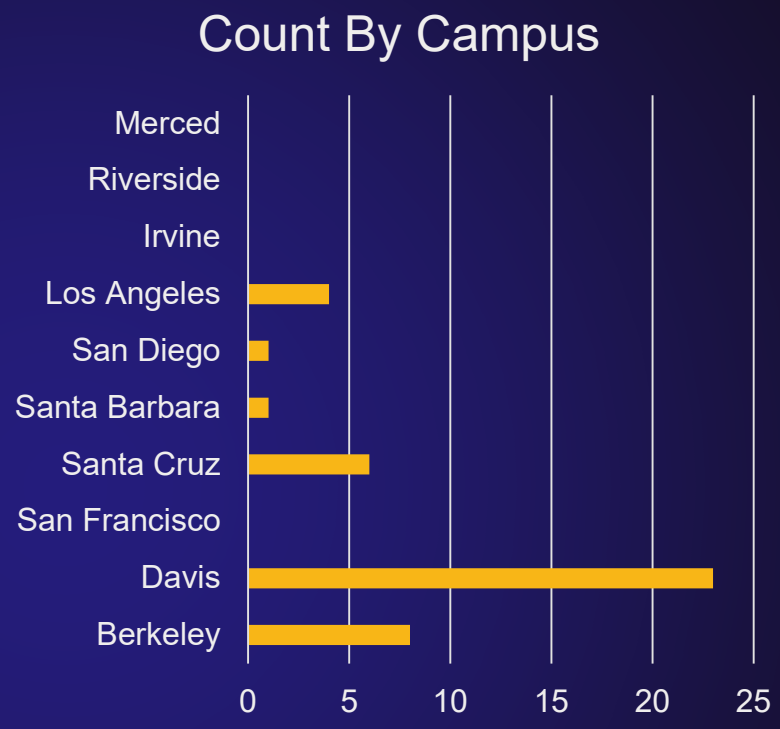
Astronomy ("Asteroids, Comets, Mars")

Primary LANL Groups

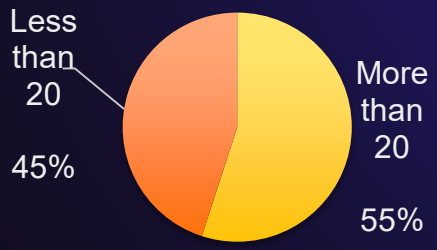
SPACE AND REMOTE SENSING

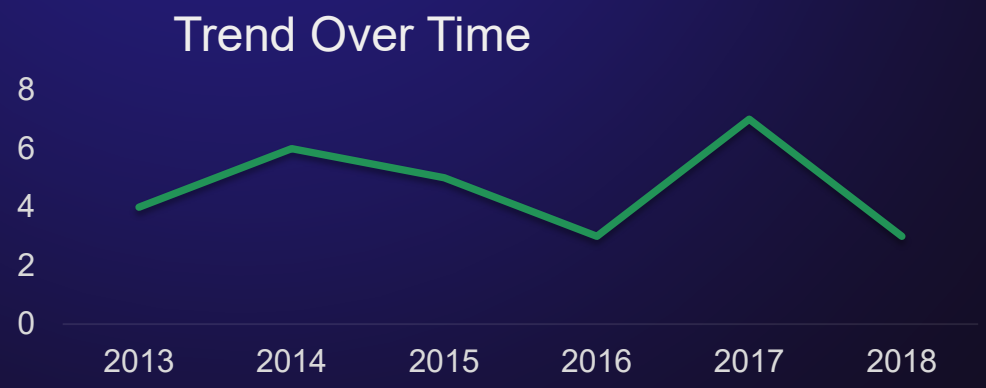
PHYSICAL CHEM & APPLIED SPECTROSCOPY

Primary LANL author: Roger Wiens



Number of Institutions

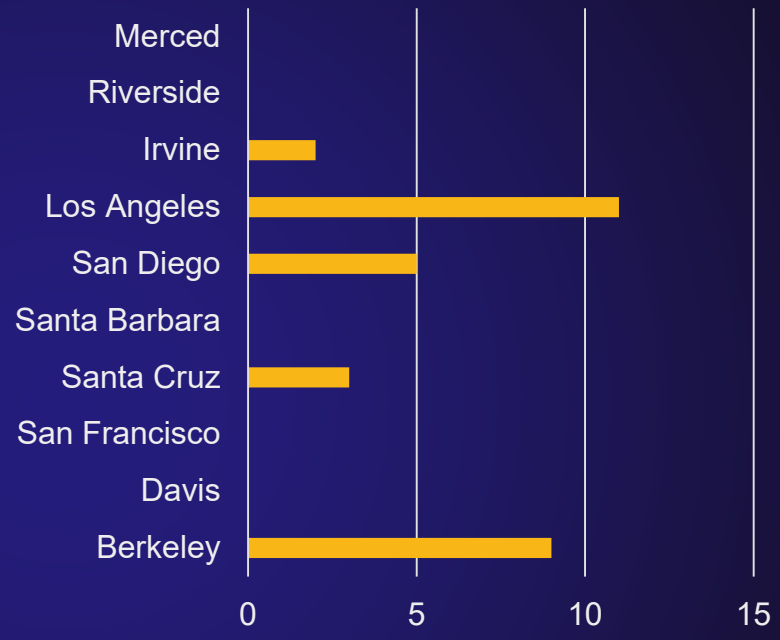




Plasma Physics ("Inertial Confinement Fusion, Laser Produced Plasmas, Plasmas")

Primary LANL Groups
PLASMA THEORY AND APPLICATIONS
PLASMA PHYSICS
PHYSICS AND CHEMISTRY OF MATERIALS
APPLIED MATHEMATICS AND PLASMA PHYSICS
THEORETICAL
EULERIAN CODES
MATERIALS AND PHYSICAL DATA
VERIFICATION AND ANALYSIS

Count By Campus

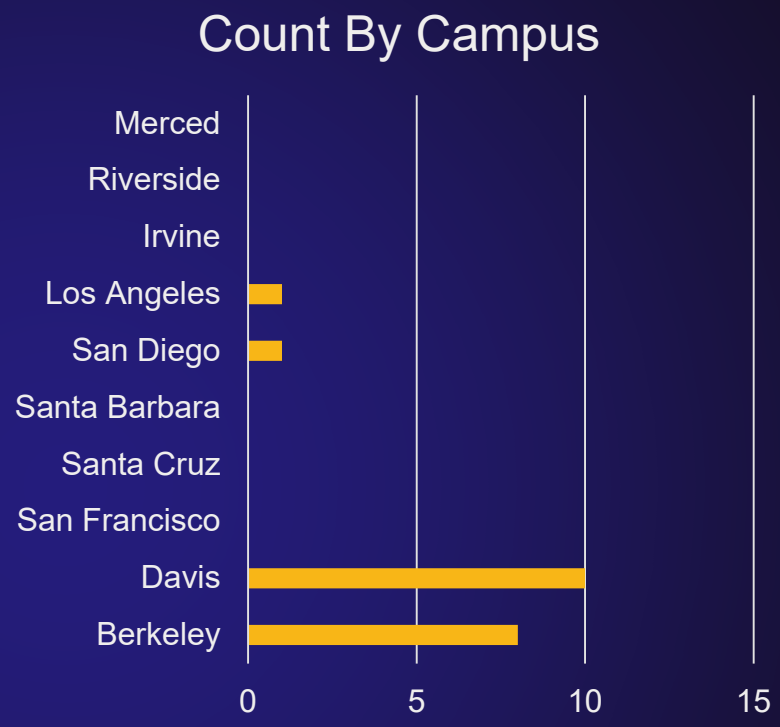


Number of Institutions

Trend Over Time

Nuclear Physics ("Nuclei, Neutrons, Reaction")

Primary LANL Groups
NUC & PARTICLE PHYS, ASTROPHYS & COSMOL
LANSCE WEAPONS PHYSICS
NUCLEAR & RADIOCHEMISTRY
NEUTRON SCIENCE & TECHNOLOGY
SUBATOMIC PHYSICS
MONTE CARLO CODES



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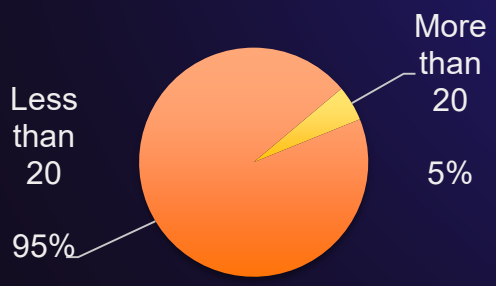
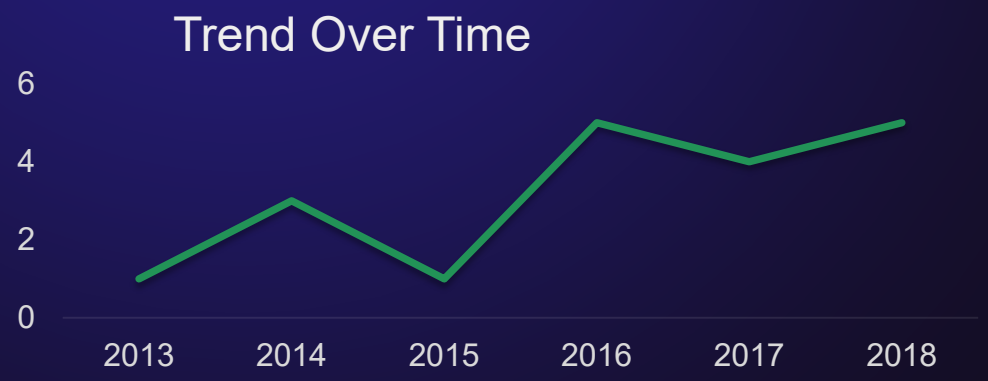
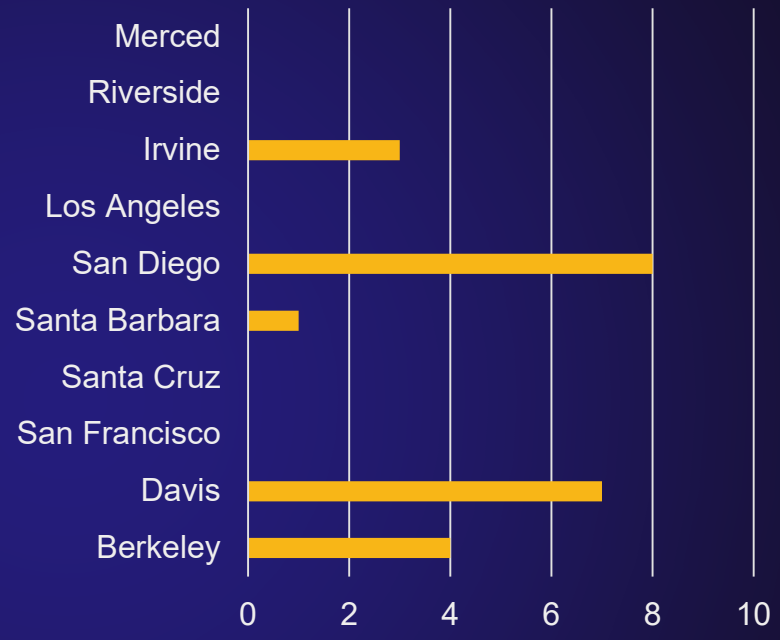




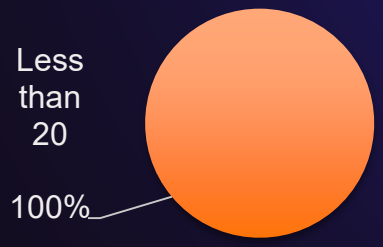
Nuclear Material Science ("Zirconium Alloys, Fuels, Nuclear Fuels")

Primary LANL Groups
MATERIALS SCIENCE IN RADIATION & DYNAMICS EXTREMES
NUCLEAR MATERIALS SCIENCE
ENGINEERED MATERIALS
EARTH SYSTEM OBSERVATIONS
Materials Synthesis and Integrated Devices
PHYSICS AND CHEMISTRY OF MATERIALS

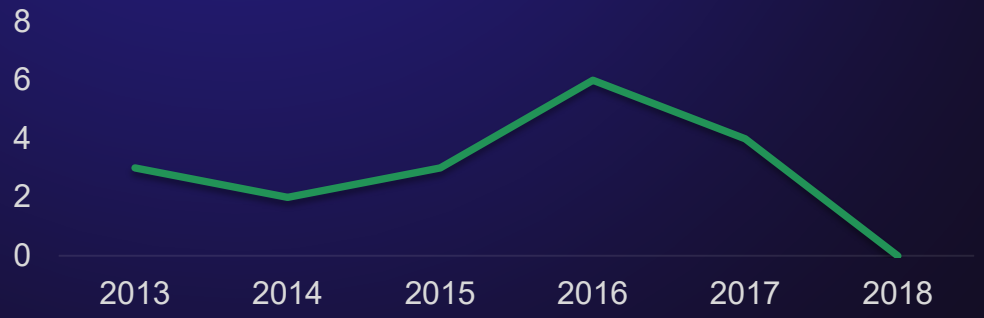
Count By Campus



Number of Institutions



Trend Over Time



UC Fee Publications

Process

- **Web of Science**
  - Search using 30 UC Fee related terms to be identified in the funding statements of the publications and Los Alamos National Laboratory

  Results=102 publications (2009-2019)

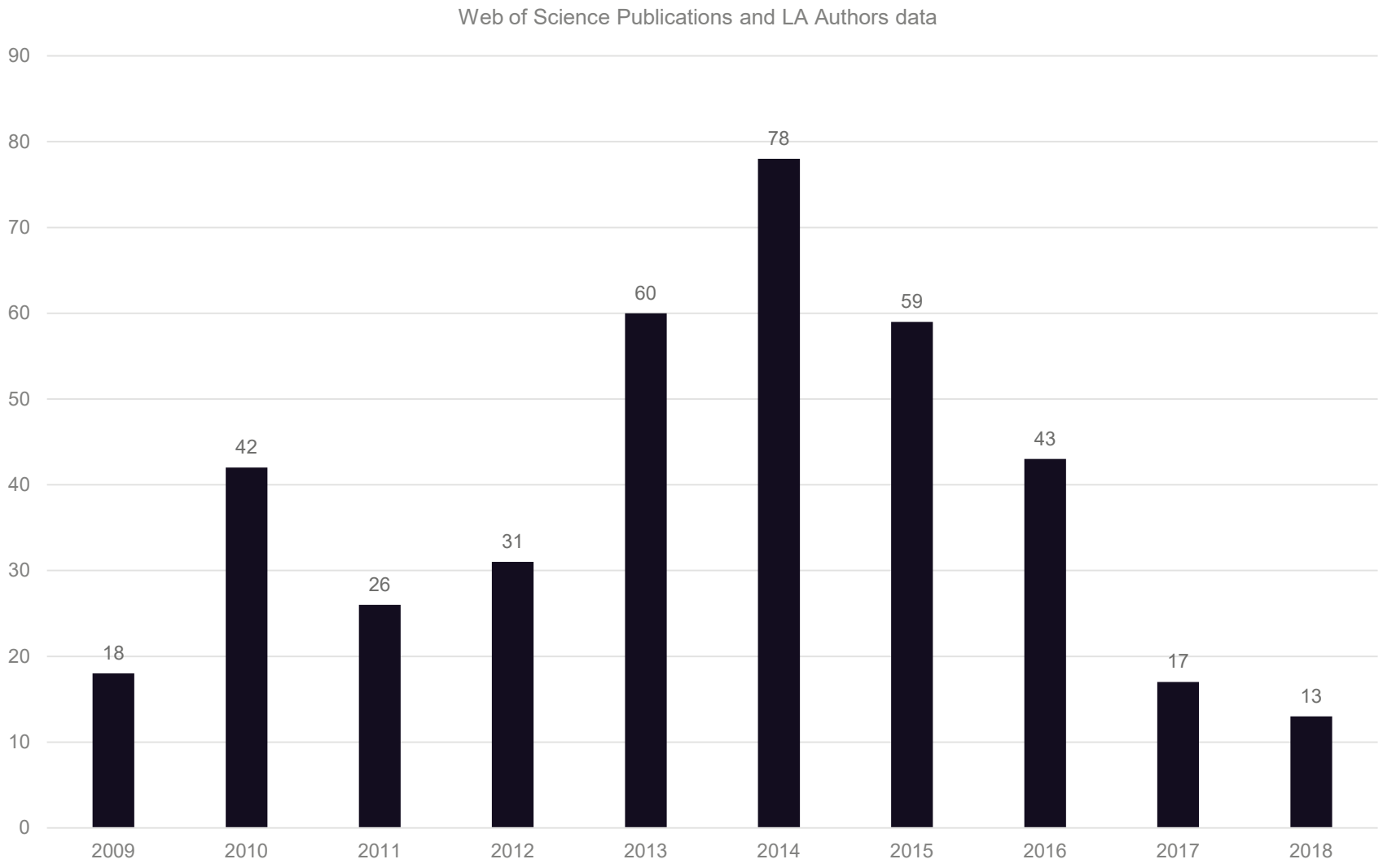
  *74 publications do not appear to have a corresponding record in LAAuthors…investigating further

- **Los Alamos Authors**
  - Search using 46 project codes in LA Authors

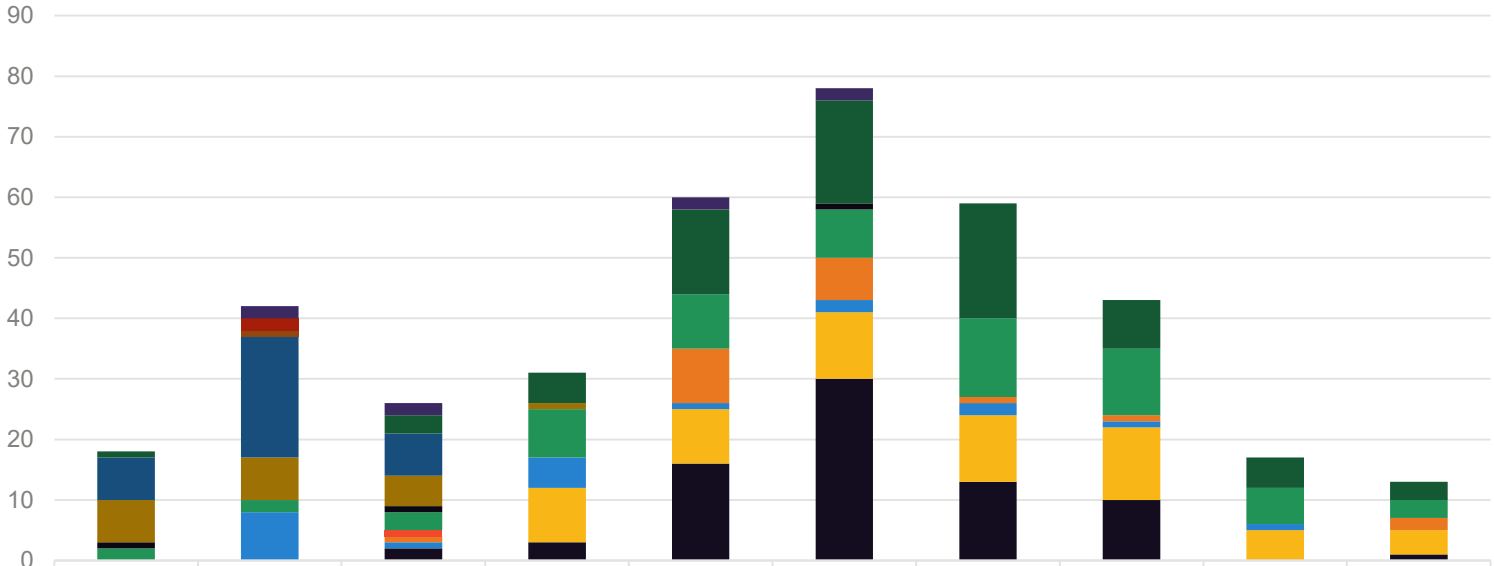
  Results=314 records (includes ALL versions –abstracts, posters, papers, etc)

- **Removed any duplicates that existed in both WoS and LA Authors, and verified that all data from previous data pull was included in the results.**
- **Totals in this presentation represent combined WoS and LA Authors data**

UC Fee Attributed Publications



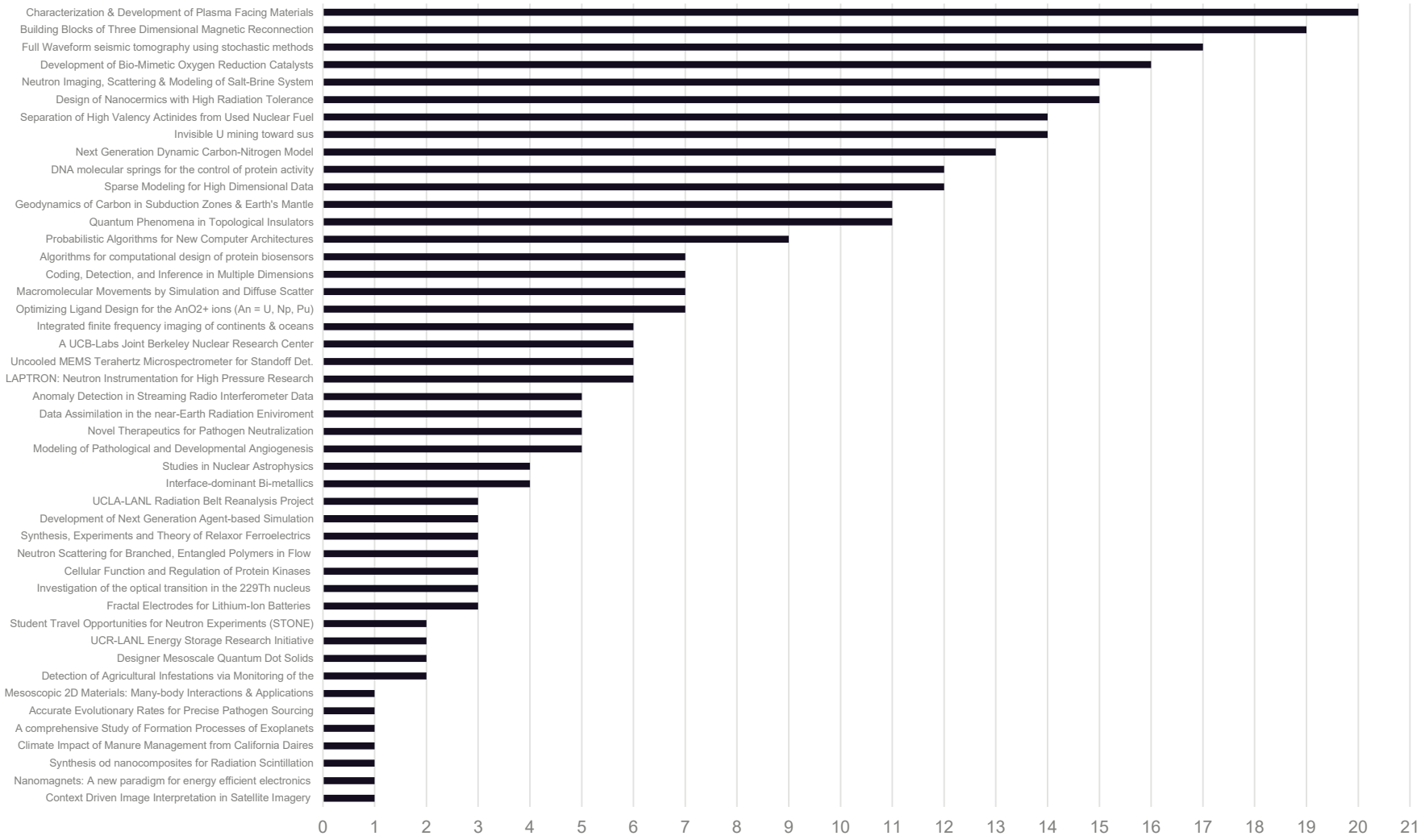
UC Fee by Document Type



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Proceedings		2	2		2	2				
Presentation	1		3	5	14	17	19	8	5	3
Book		2								
Electronic (e.g. web)		1								
Meeting	7	20	7							
Journal	7	7	5	1						
Review	1		1			1				
Article	2	2	3	8	9	8	13	11	6	3
Summary			1							
Poster			1		9	7	1	1		2
Other		8	1	5	1	2	2	1	1	
Full Paper				9	9	11	11	12	5	4
Abstract			2	3	16	30	13	10		1

Documents by project name

Does not include 73 docs that do not have project name identified



UC Postdocs and Students at LANL

UC Postdocs and Students at LANL, 2009 -2019

- Data showing UC student & postdoc initial employment and conversion from FY 09 through FY19
- FY 09 includes students and postdocs who started in earlier years
- Postdoc conversion typically occurs 2-3 years after initial recruitment

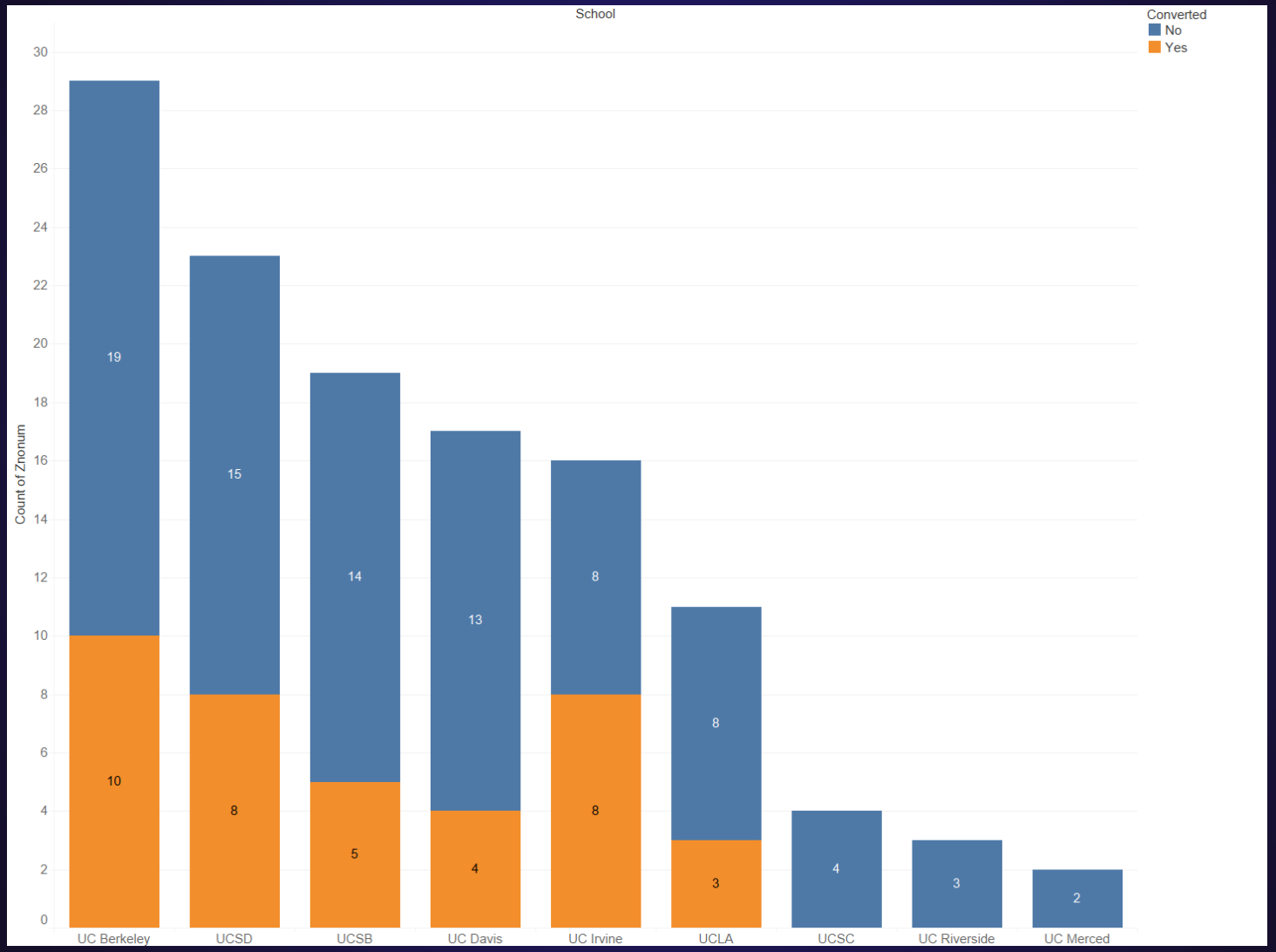
UC Postdocs and Students at LANL

Employment Type	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Grand Total
Administrative Student	7	1	1	1	1	1	2	1				15
Distinguished PostDoc	1								1	1		3
PostDoc	46	13	14	15	15	11	5	6	11	11	5	152
Technical Student	48	21	12	10	11	6	13	8	12	14	1	156
Grand Total	**102**	**35**	**27**	**26**	**27**	**18**	**20**	**15**	**24**	**26**	**6**	**326**

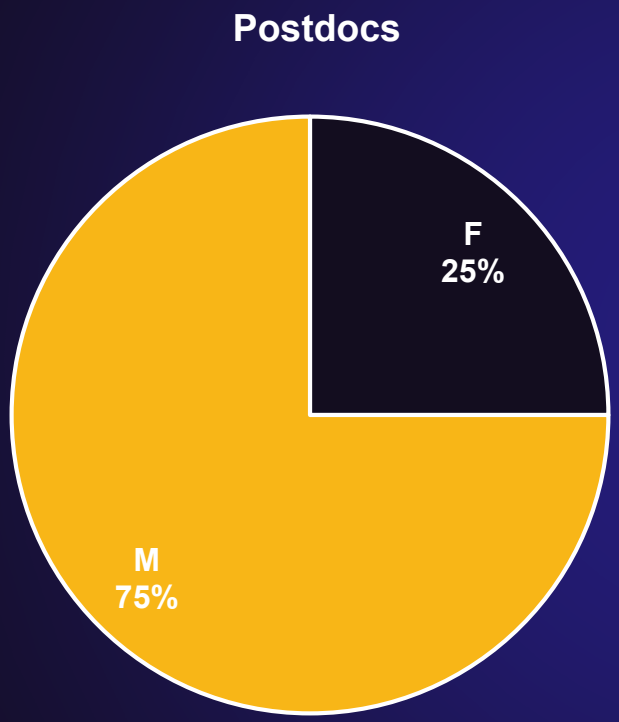
Converted	2009	2010	2011	2012	2013	2014	2015	2016	2017	Grand Total
Administrative Student	3						1			4
Distinguished PostDoc	1									1
PostDoc	21	1	2	7	3	4		1	8	47
Technical Student	14	4	1	4	3				12	38
Grand Total	**39**	**5**	**3**	**11**	**6**	**4**	**1**	**1**	**20**	**90**

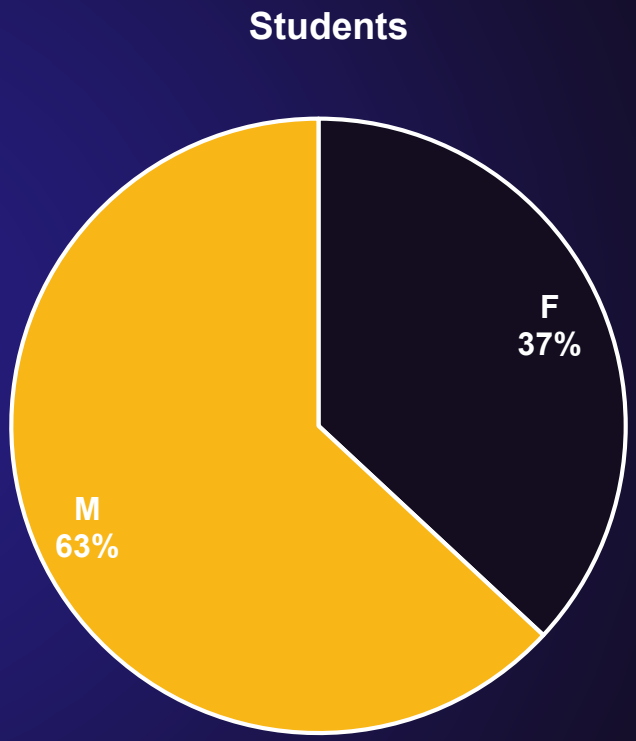
* FY 09 includes students and postdocs who started in earlier years

Converted & Not Converted Postdocs by School, 2009-2019

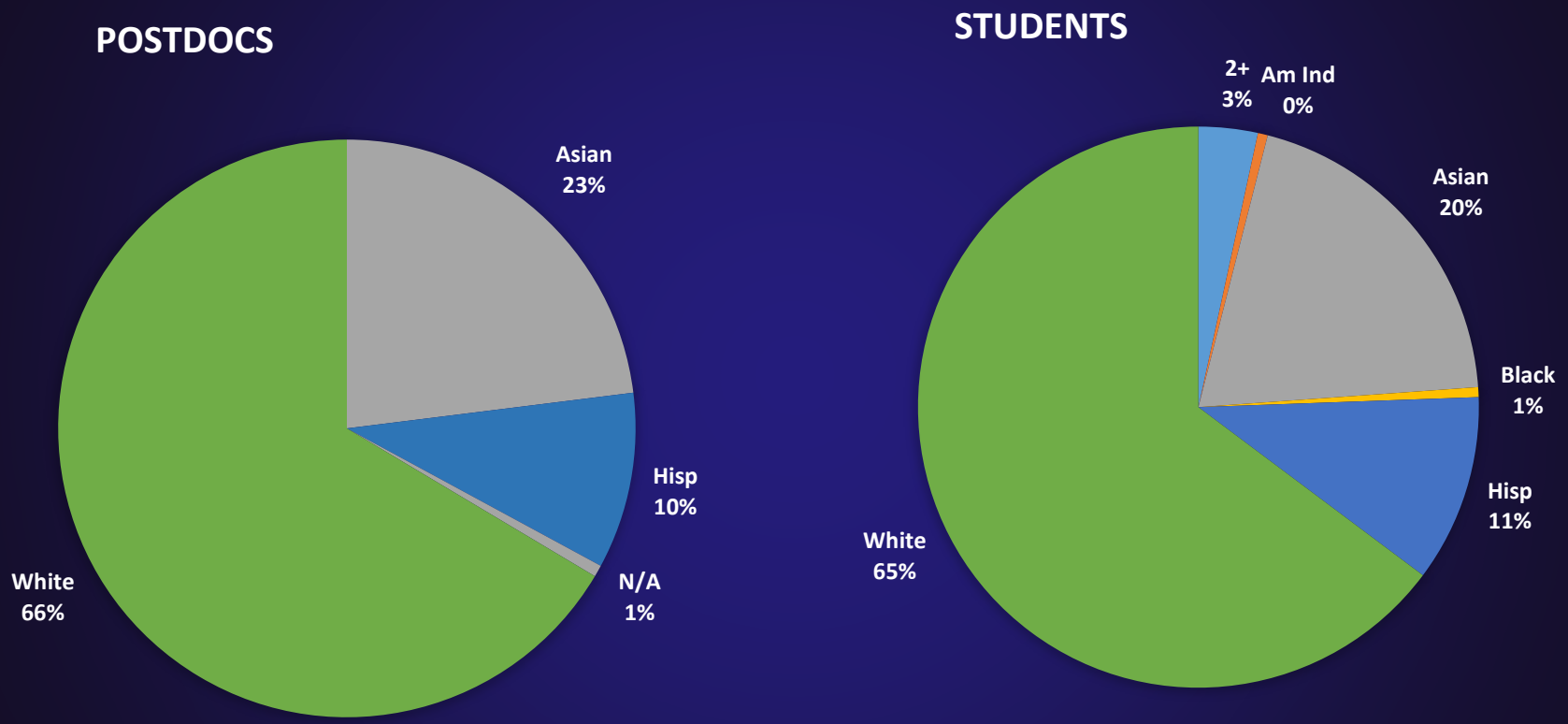


Postdocs and Students by Gender, 2009-2019

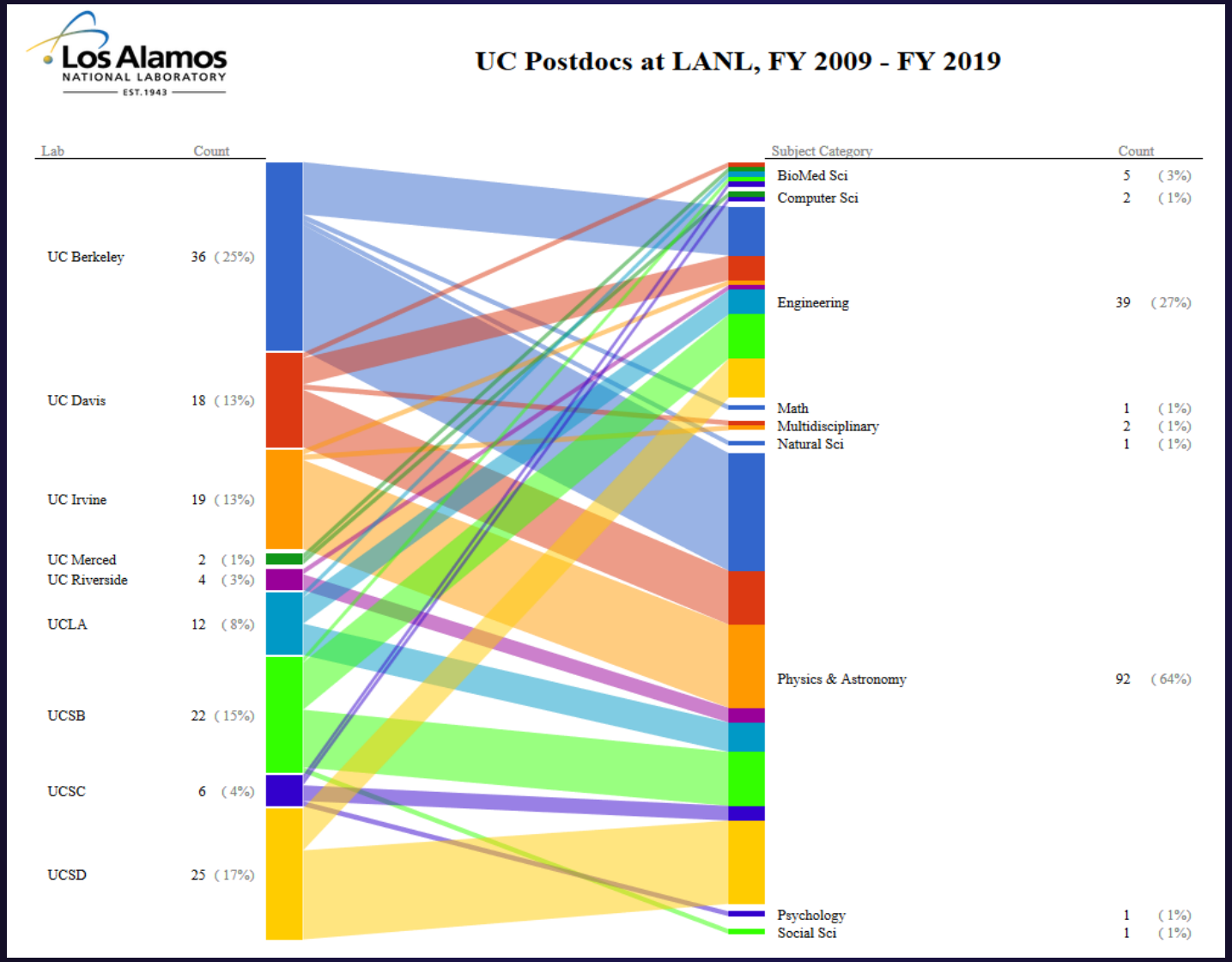




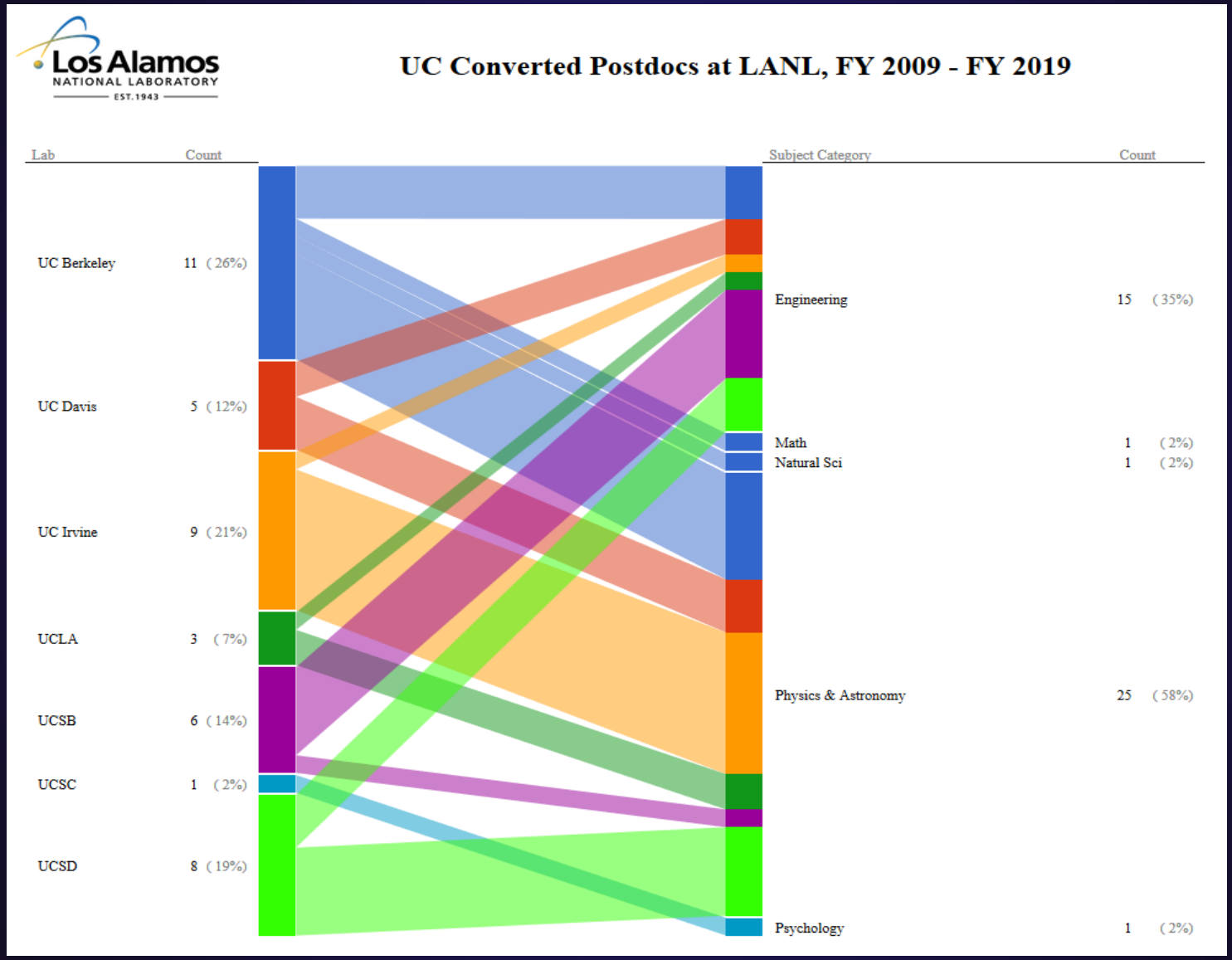
Postdocs and Students by Ethnicity, 2009-2019



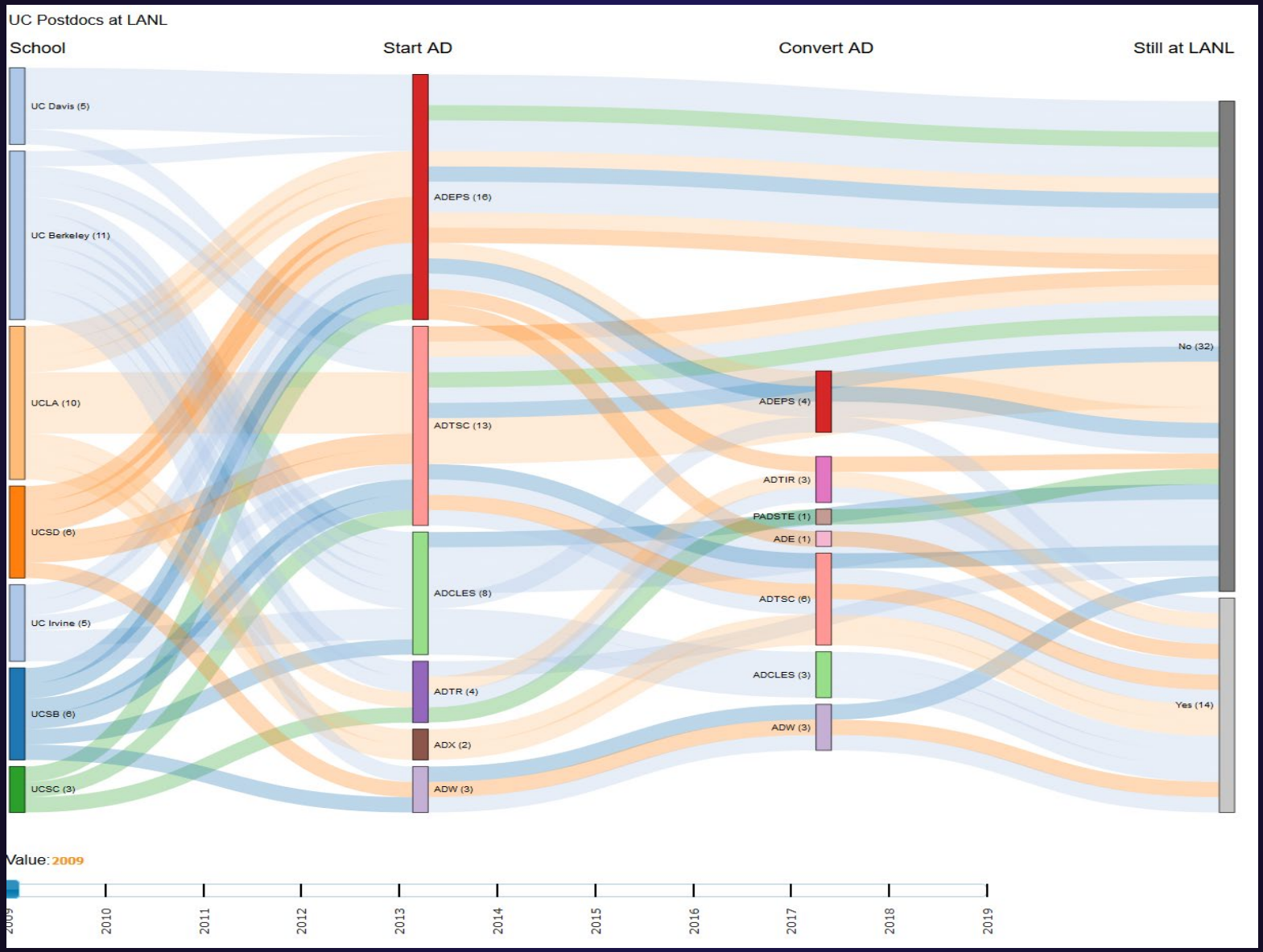
Postdocs by School and Major (interactive)



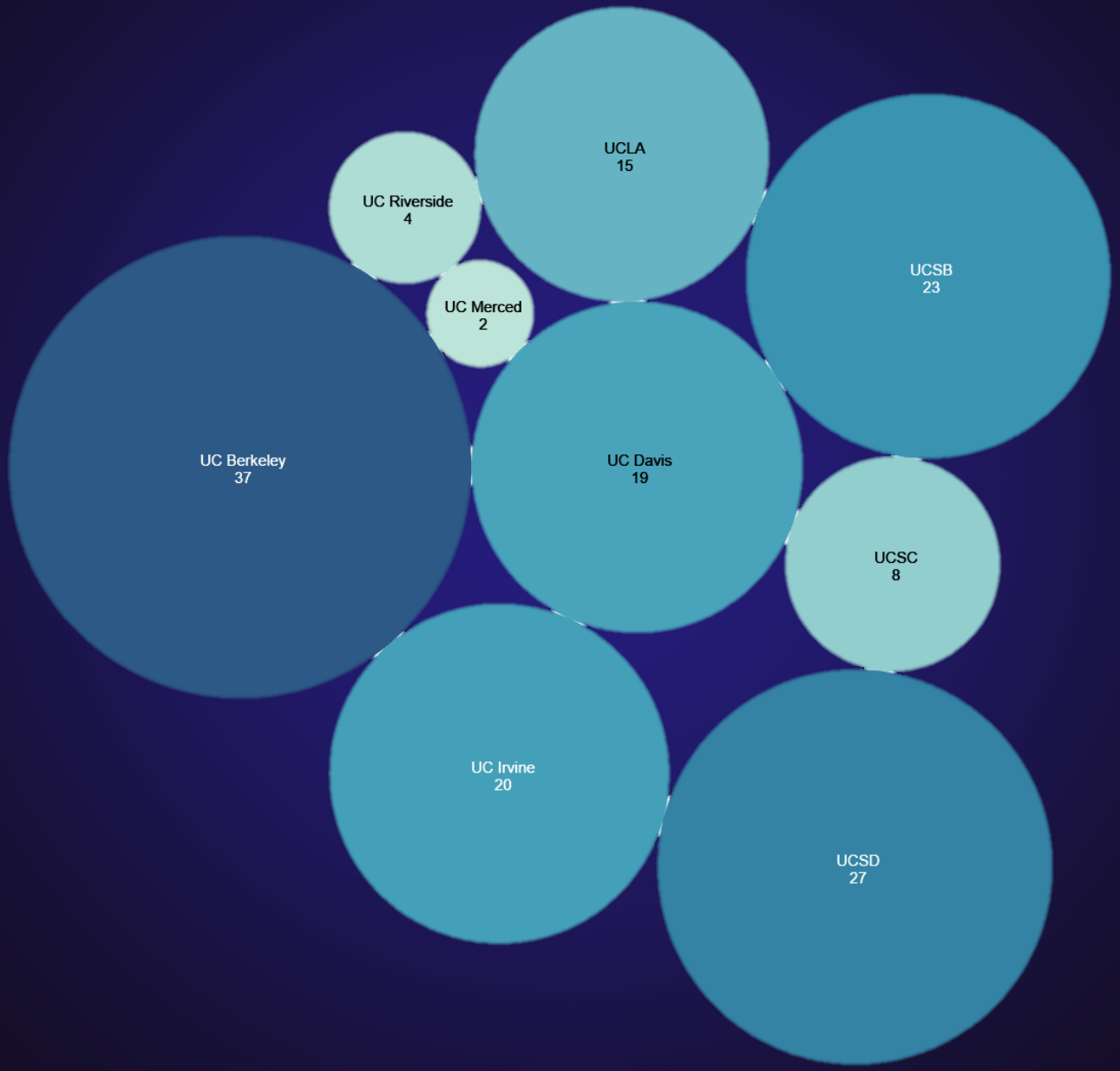
Converted Postdocs by School and Major (interactive)



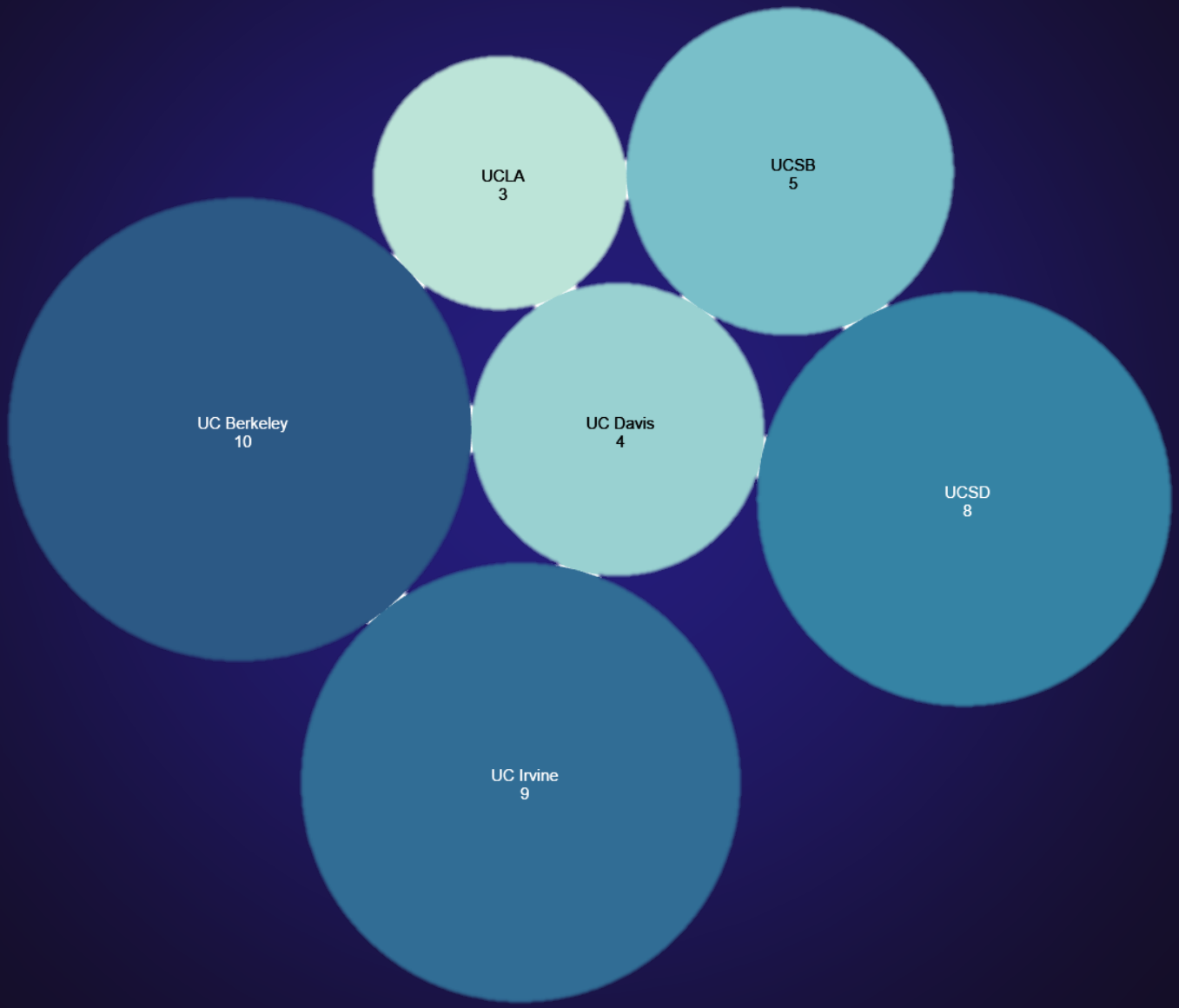
Converted Postdocs by Fiscal Year (interactive)



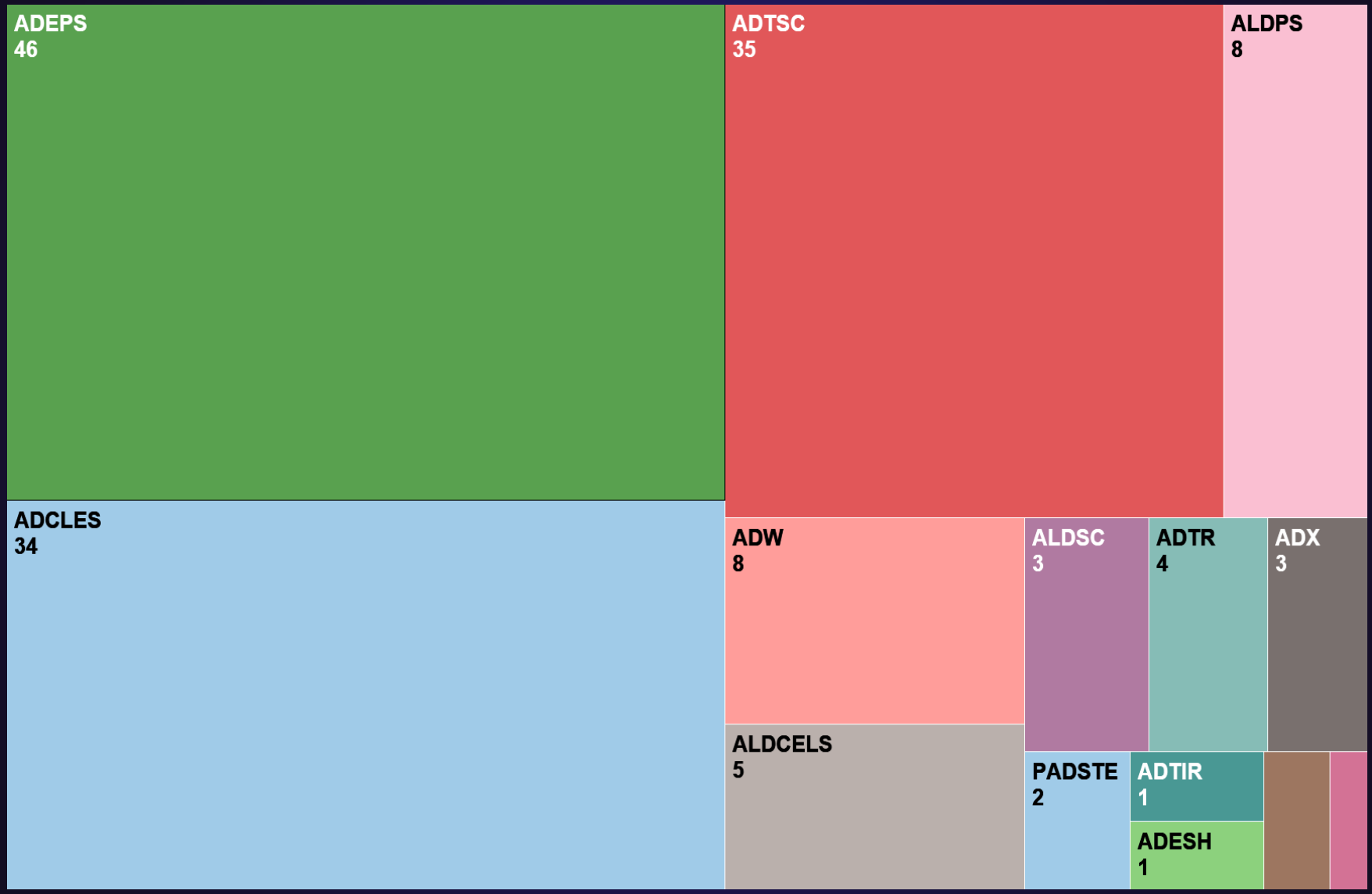
Postdocs by School



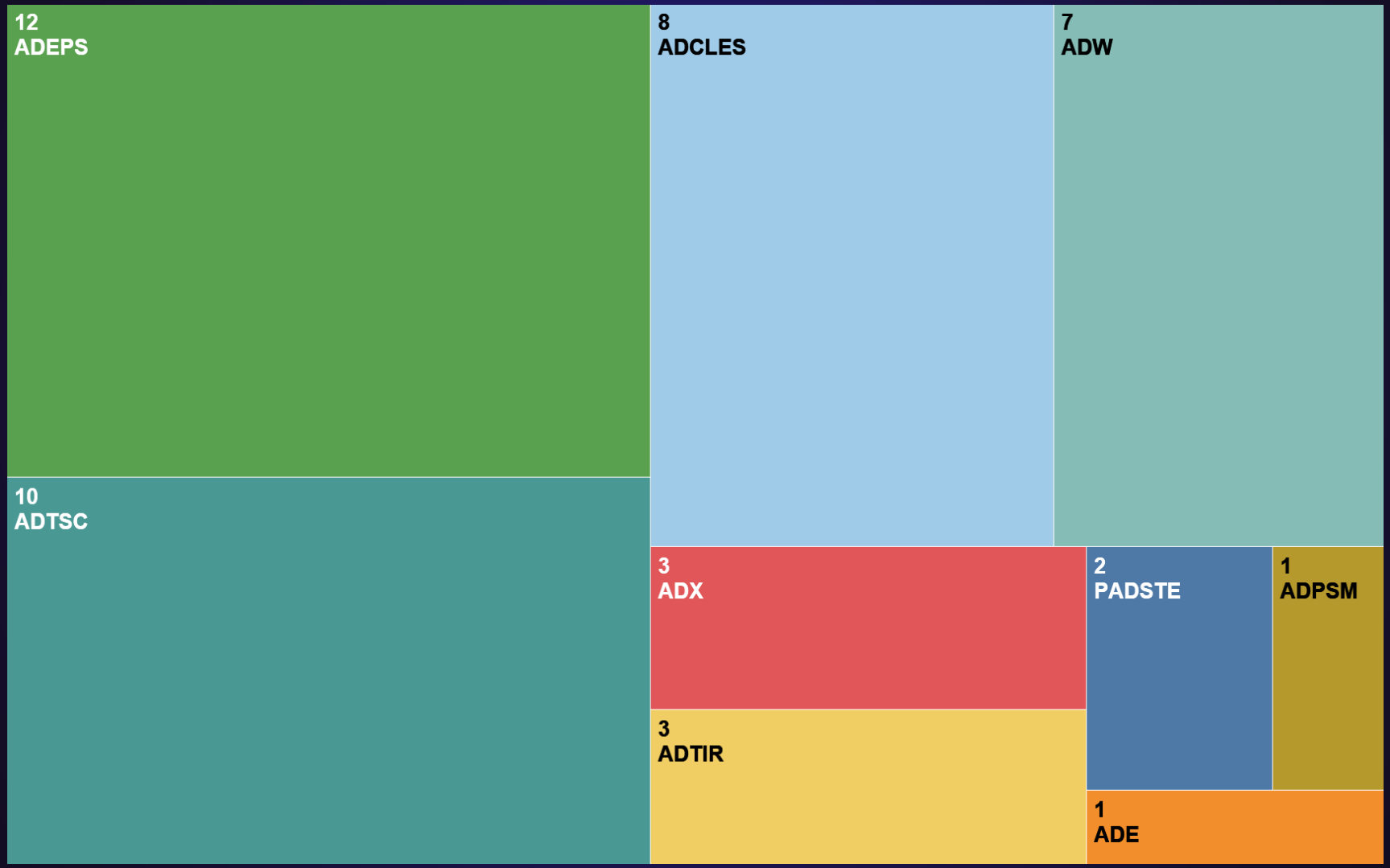
Converted Postdocs by School



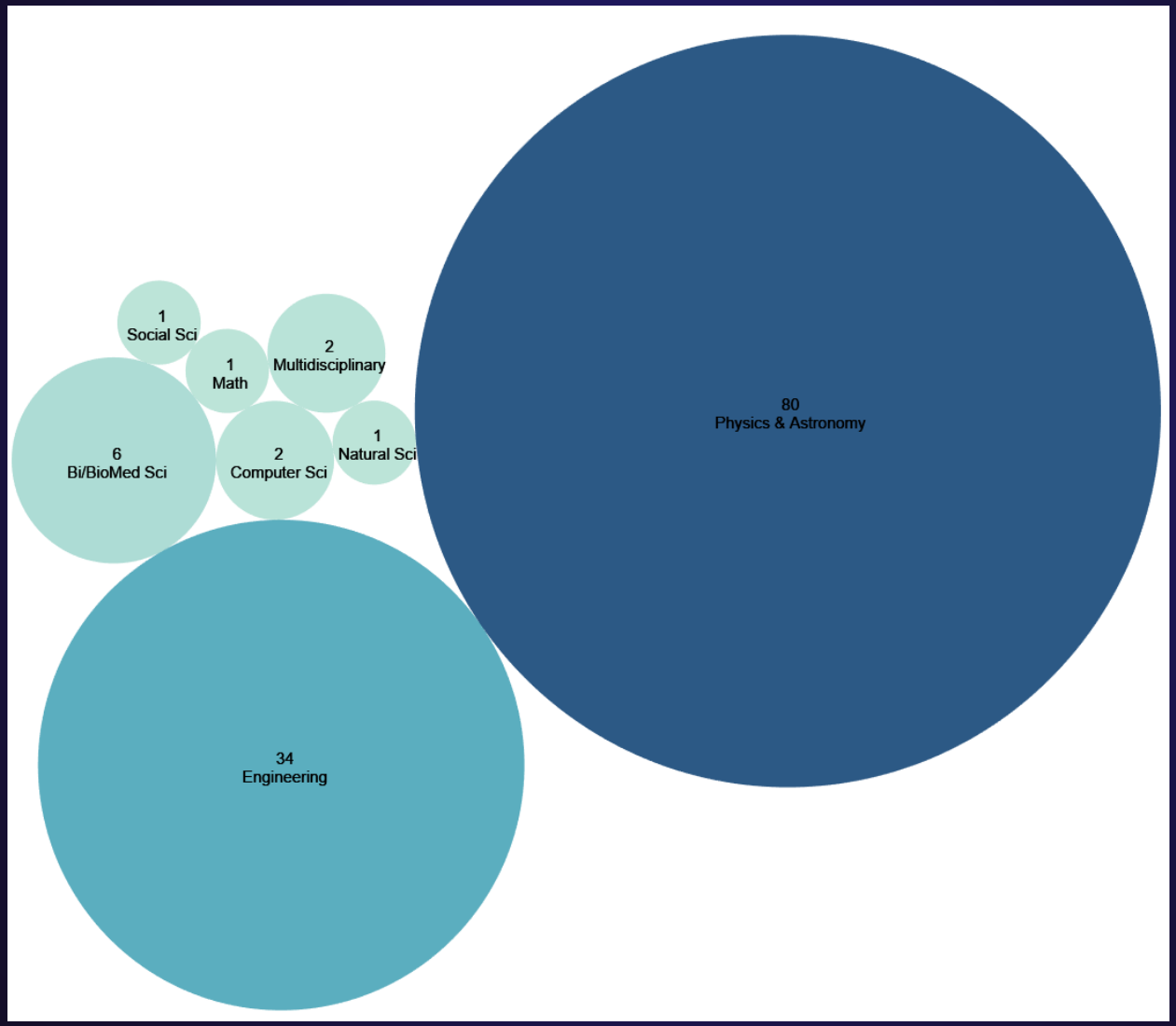
Postdocs by Start Associate Directorate



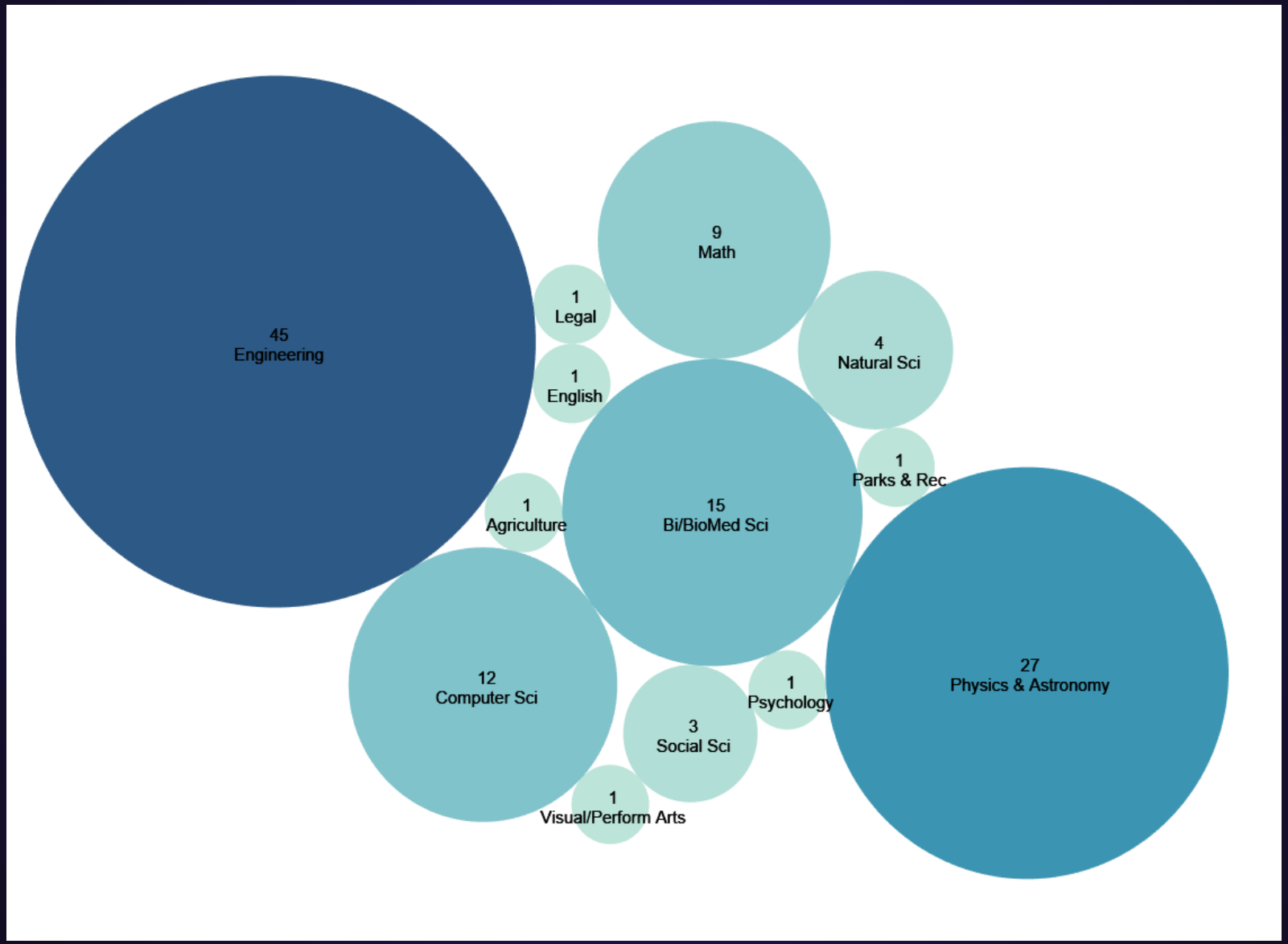
Postdocs by Convert Associate Directorate



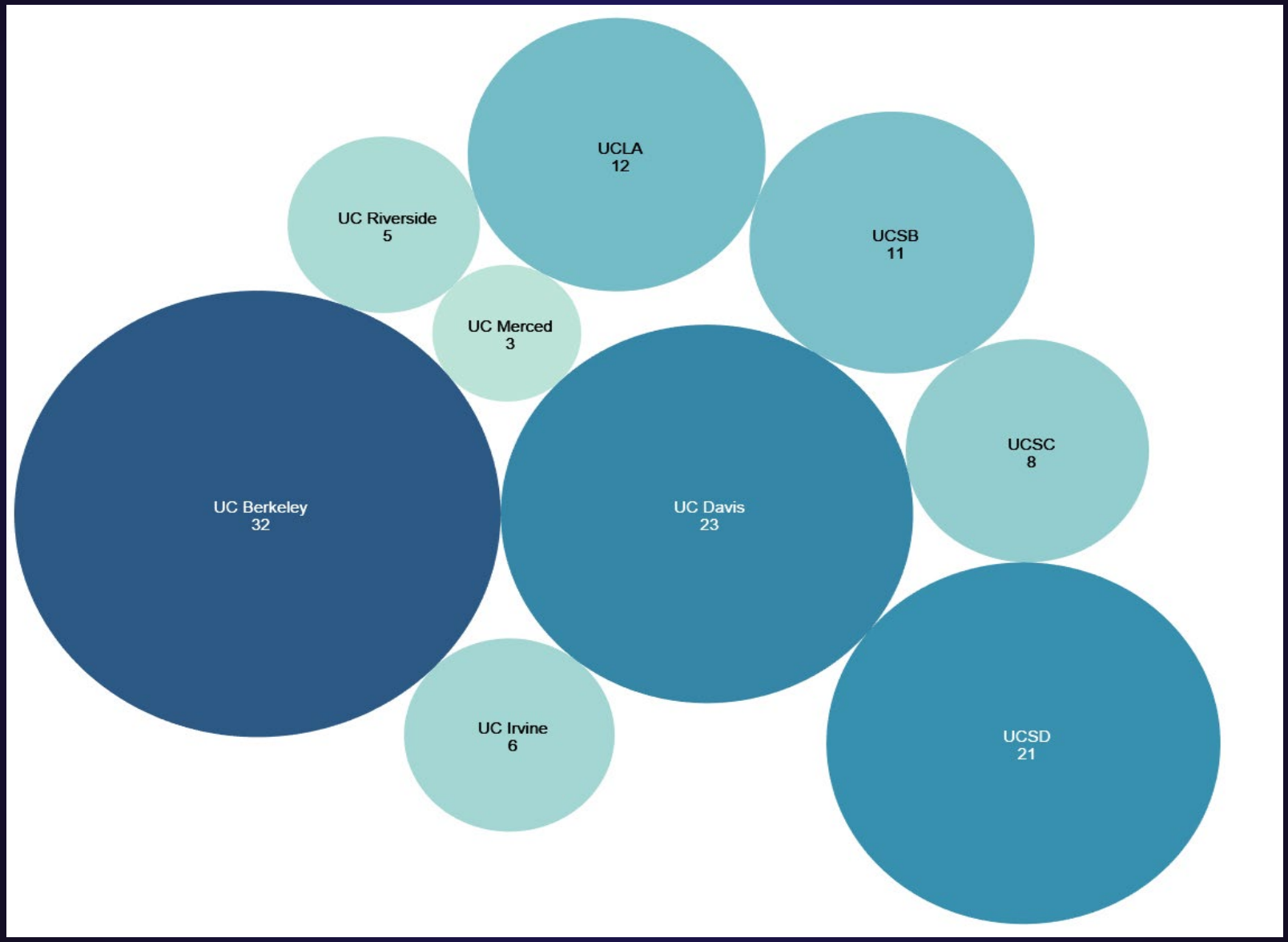
Postdocs by Major



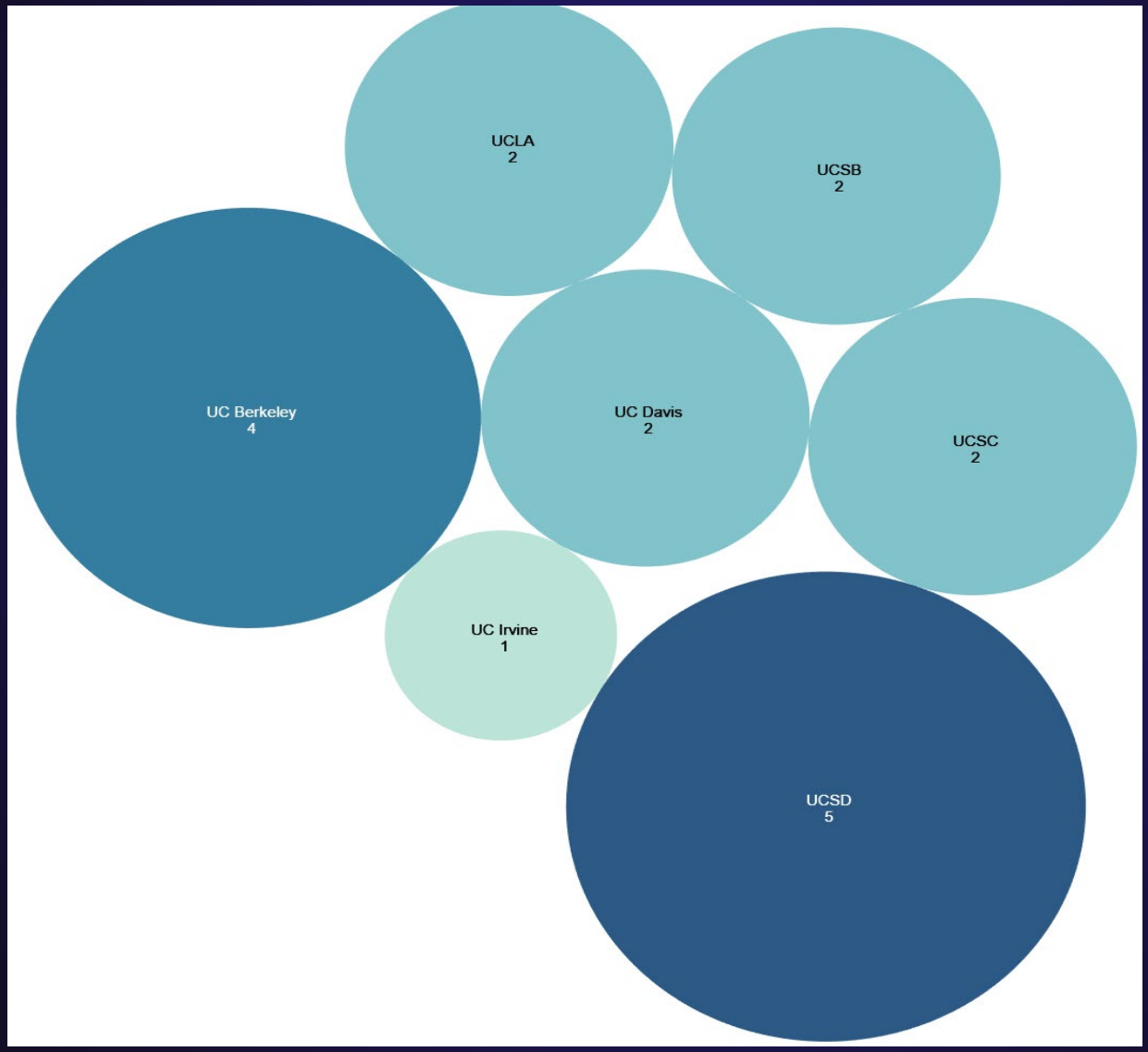
Students by Major



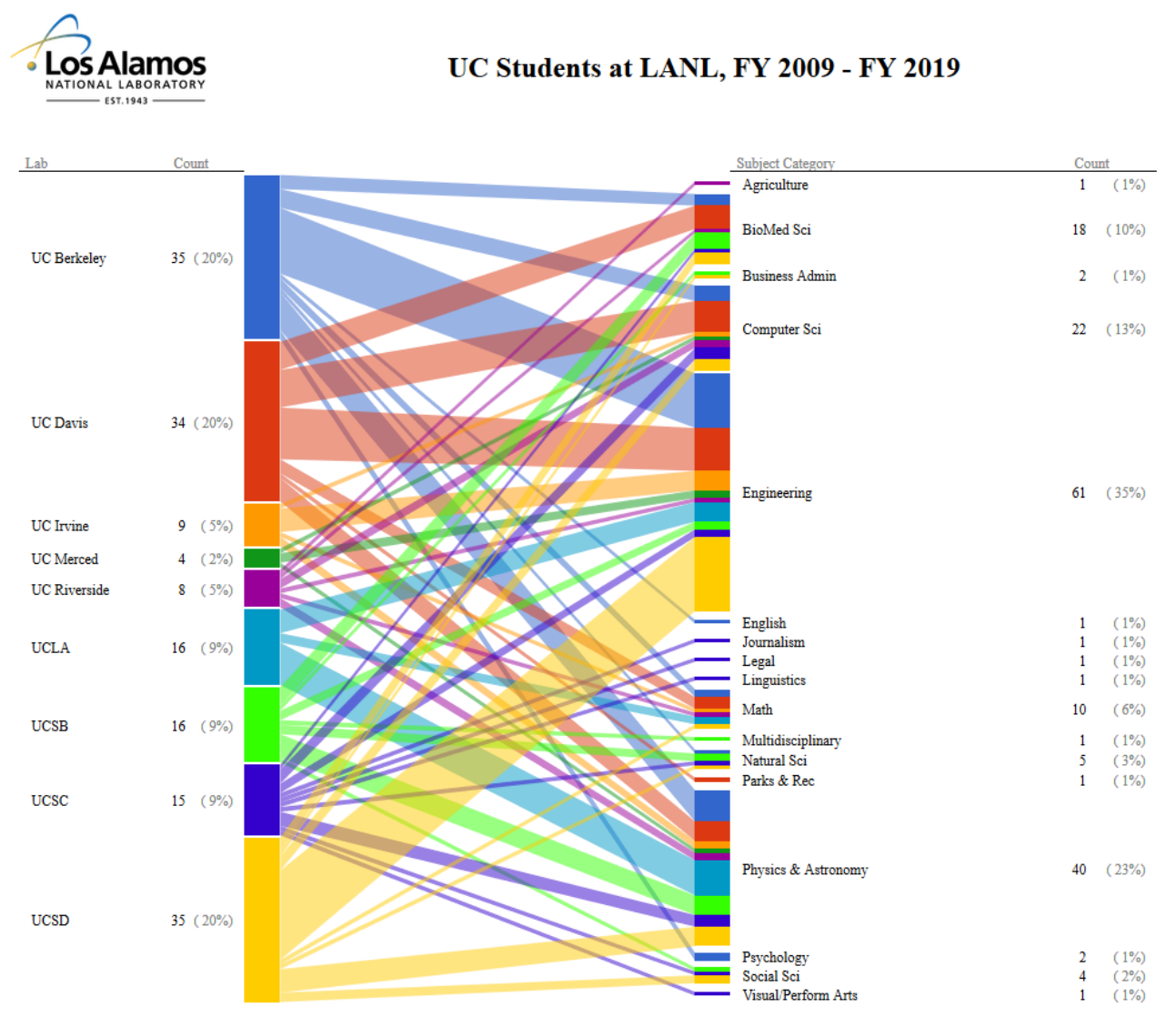
Students by School



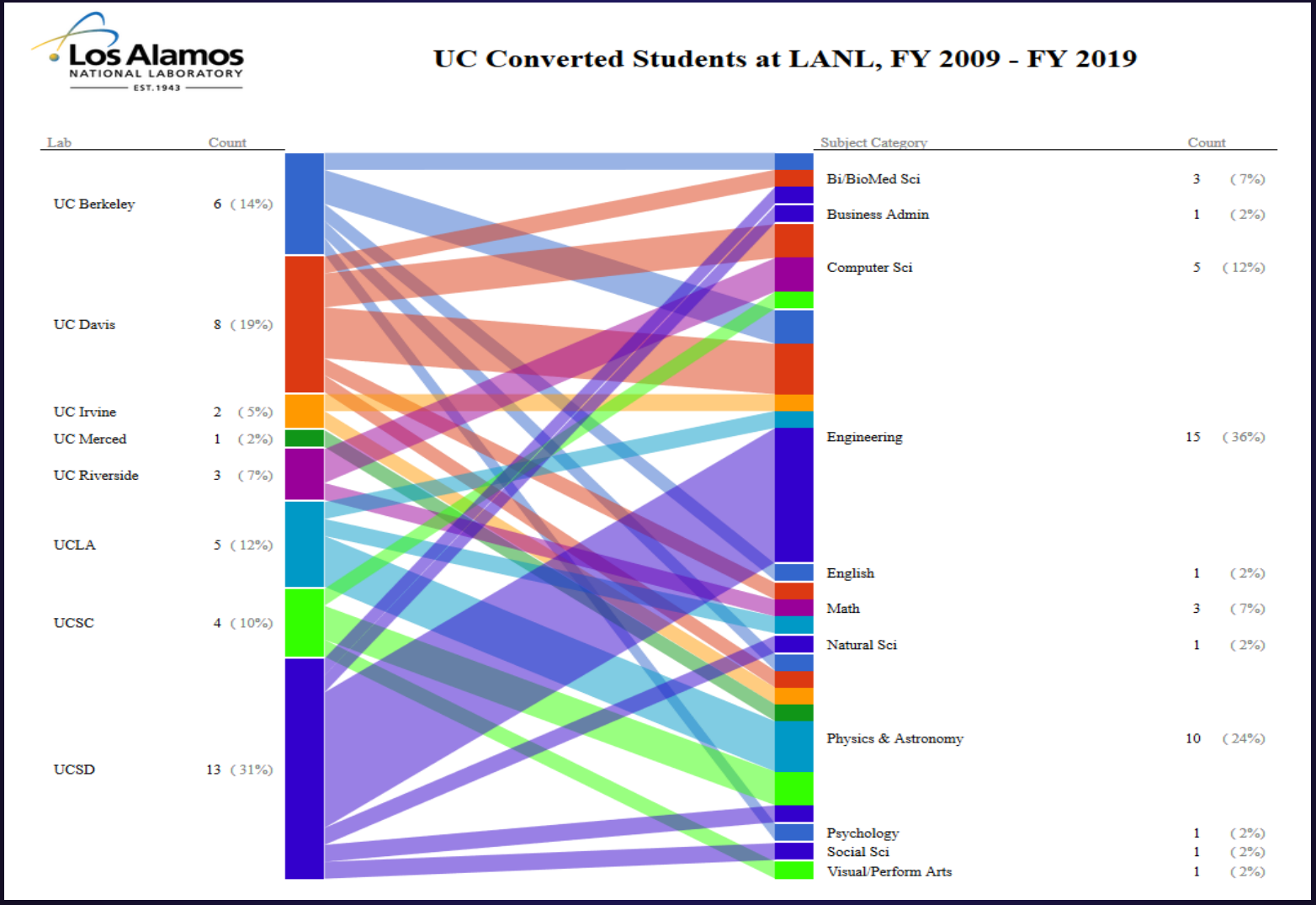
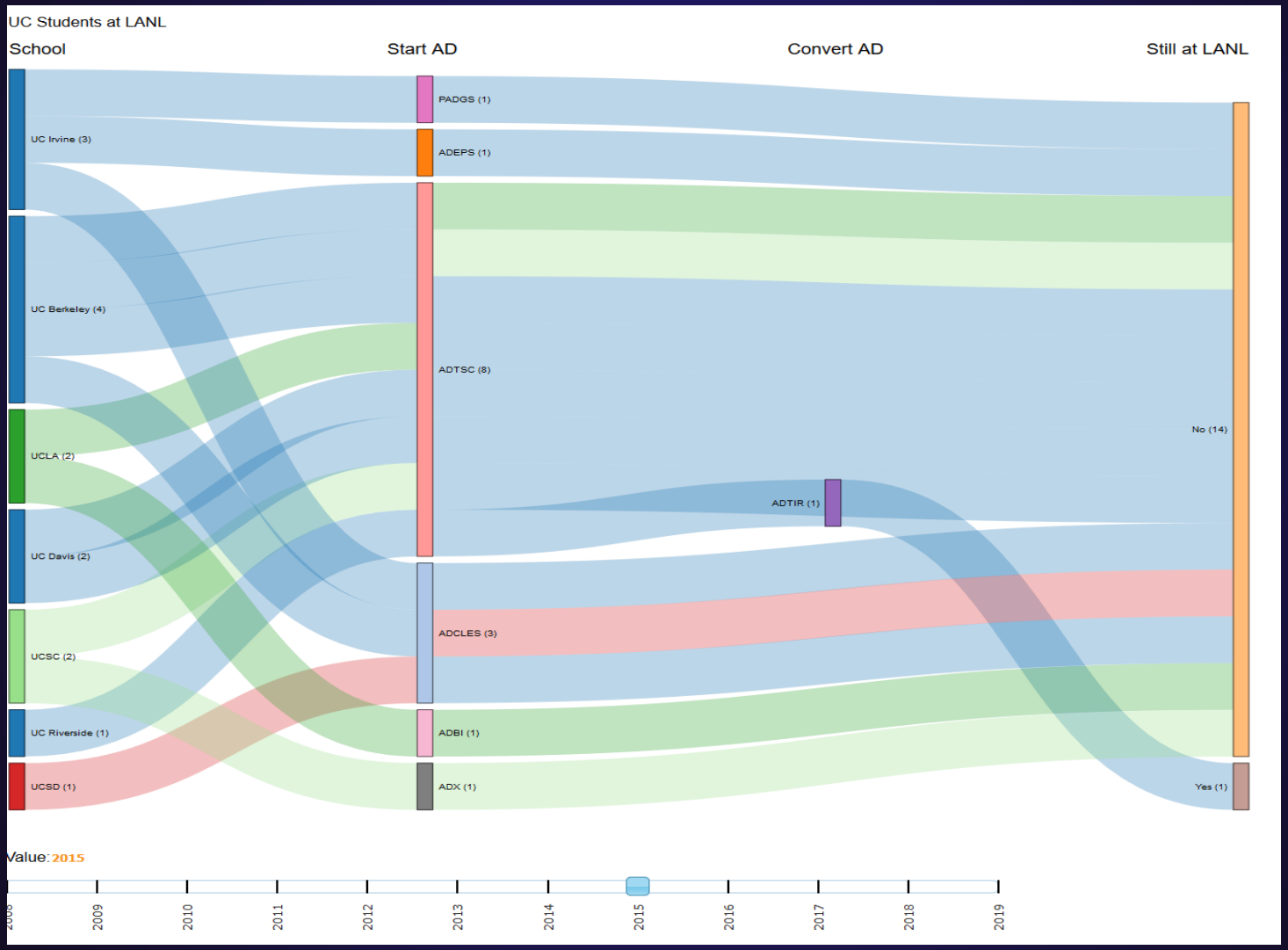
Converted Students by School



Students by School and Major (interactive)



Converted Students by School & Major (interactive)



Student Conversion by FY (interactive)