2024 SIAG/DATA

SIAM Conference on Mathematics of Data Science

Data Science Business Meeting

Thursday, October 24th, 6:00 – 7:00 pm
Grand Salon, 2nd floor
Hilton Atlanta

2024 SIAG/DATA BUSINESS MEETING

siam | Society for Industrial and Applied Mathematics

SIAG/DATA Officers

Chair:
Lars Ruthotto

*

Vice Chair:
Dirk A. Lorenz

*

Program Director:
Rebecca Morrison

*

Secretary:
Jamie Haddock

SIAG/DATA Thank you to the 2022-23 Officers

Chair:

Ilse C.F. Ipsen

*

Vice Chair:

Lars Ruthotto

*

Program Director:

David Gleich

*

Secretary:

Stefanie Guenther

SIAG/DATA Announcements

- SIAM Engage:
  - https://engage.siam.org/communities/siag-data-home?CommunityKey=31956aa3-d01a-4574-9c74-90ae239d19c8
  - SIAG/DATA websites:
  - https://www.siam.org/membership/activity-groups/detail/data-science
  - SIAM News: Story Ideas
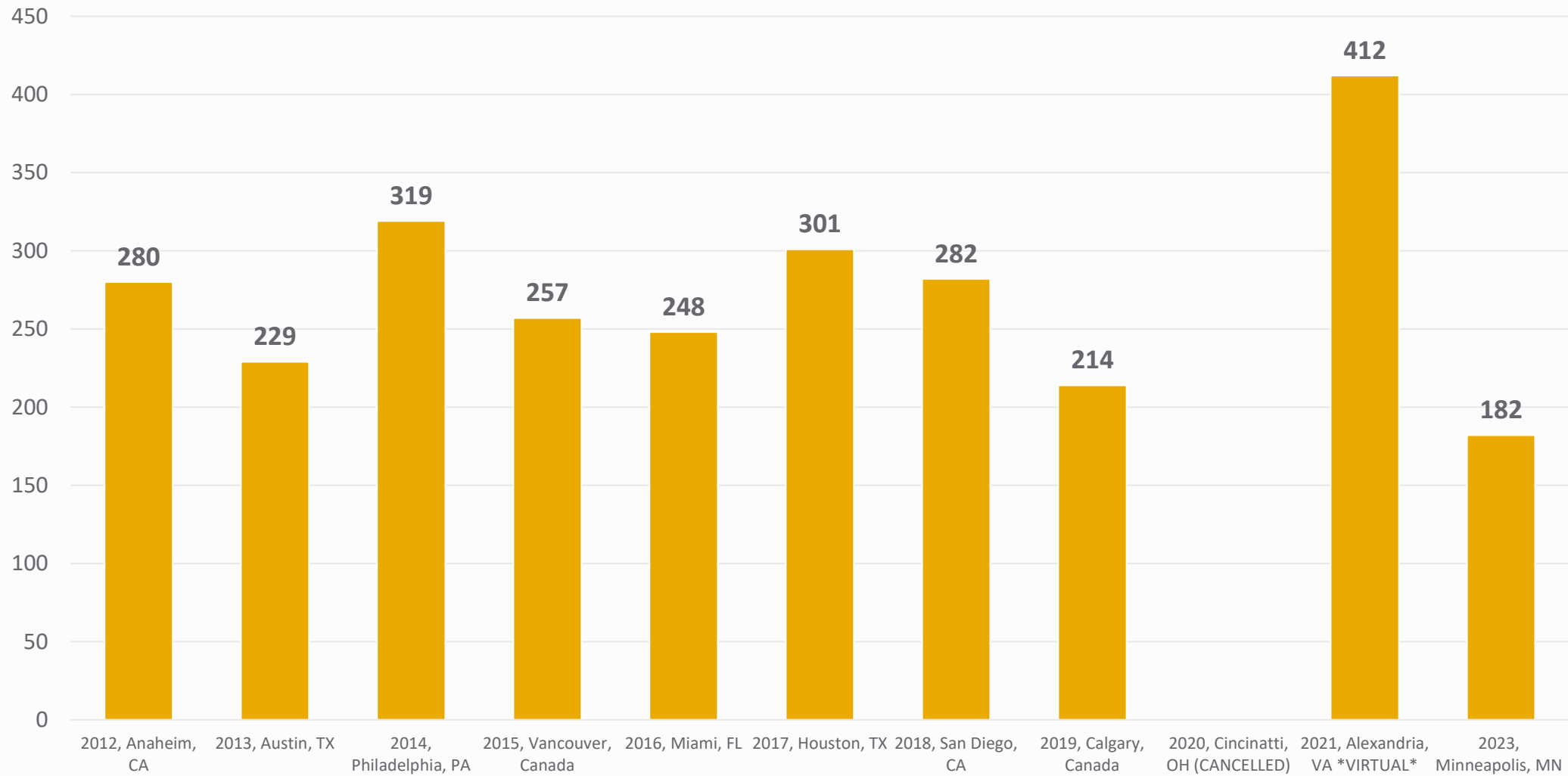- SIAM Blogs

SIAG/DATA Fellows

Class of 2023

George Biros

Ron Buckmire

Coralia Cartis

Lenore Cowen

Chandrika Kamath

Ali Pinar

Caroline Uhler

Class of 2024

David Bindel

Hans de Sterck

Carola-Bibiane Schönlieb

SDM Conference History

SIAG/DATA MDS Conference 2024

Organizing Committee Co-Chairs

Eric Chi, Rice University, U.S.
David Gleich, Purdue University, U.S.
Rachel Ward, University of Texas at Austin, U.S.

Organizing Committee

Yuejie Chi, Carnegie Mellon University, U.S.
Karina Montilla Edmonds, SAP, U.S.
Margot Gerritsen, Stanford University and Women in Data Science Worldwide, U.S.
Anna Gilbert, Yale University, U.S.
Nicolas Gillis, University of Mons, Belgium
Jamie Haddock, Harvey Mudd College, U.S.
Gal Mishne, University of California, San Diego, U.S.
Emilie Purvine, Pacific Northwest National Laboratory, U.S.
Justin Romberg, Georgia Institute of Technology, U.S.
Fred Roosta, University of Queensland, Australia
Shashanka Ubaru, IBM Research and University of Texas at Austin, U.S.
Dootika Vats, Indian Institute of Technology Kanpur, India
Talitha Washington, Clark Atlanta University & Atlanta University Center, U.S.
Wotao Yin, Alibaba Group US/DAMO Academy, U.S.

SIAG/DATA Conference 2024

SIAG/DATA Early Career Prize

Learning Matchings, Maps, and Trajectories
Tuesday, October 22th, 3:40 PM – 4:25 PM
Room: Grand Salon, 2nd floor
Chair: TBD.

This talk will survey some recent advances in the statistical theory of optimal transport. Optimal transport provides a geometrical theory to describe transformations of probability distributions, making it a suitable framework for applications from machine learning to high-energy physics. We will study statistical estimators for this problem, characterizing their finite-sample behavior and obtaining distributional limits suitable for practical inference.

Additionally, we will explore structural assumptions that improve the statistical and computational performance of these estimators in high dimensions.

Jonathan Niles-Weed
New York University, U.S.

SIAG/DATA Conference 2024

SIAG/DATA Career Prize

Learning Low-rank Functions With Neural Networks

Wednesday, October 23rd, 3:40 PM – 4:25 PM
Room: Grand Salon, 2nd floor
Chair: TBD.

Neural networks are increasingly prevalent and transformative across domains. Understanding how these networks operate in settings where mistakes can be costly (such as transportation, finance, healthcare, and law) is essential to uncovering potential failure modes. Many of these networks operate in the "overparameterized regime," in which there are far more parameters than training samples, allowing the training data to be fit perfectly. What does this imply about the predictions the network will make on new samples? That is, if we train a neural network to interpolate training samples, what can we say about the interpolant, and how does this depend on the network architecture?

In this talk, I will describe insights into the role of network depth using the notion of representation costs – i.e., how much it "costs" for a neural network to represent various functions. Understanding representation costs helps reveal the role of network depth in machine learning and the types of functions learned, relating them to Barron and mixed variation function spaces, such as single- and multi-index models.

Rebecca Willett
The University of Chicago, U.S.

Future conferences?

LOCATION

DATES

THEMES

Gene Golub SIAM Summer School

Iterative and Randomized Methods for Large-Scale Inverse Problems

July 22nd - August 2nd 2024

Campus of the Escuela Politécnica Nacional, Ladrón de Guevara E11-253, Quito, Ecuador.

Our Summer School will enable students to learn state-of-the-art mathematical and statistical tools to discover information hidden within large-scale data sets and solve complex inverse problems. Through hands-on experience with techniques from Randomized Numerical Linear Algebra, data assimilation, iterative algorithms, and inverse problems we will offer students a two-week summer school to learn this valuable range of computational mathematics topics.

SIAM will be accepting proposals for the 2026 school in the fall, with a deadline of January 31, 2025.

For more information visit: https://www.siam.org/students-education/programs-initiatives/gene-golub-siam-summer-school

SIAM Journals

SIAM's 18 journals are all available for download on SIAM's virtual library, epubs.siam.org. SIAM's virtual library is the definitive source for the final, peer-reviewed version of every published article, so be sure to utilize it!

Questions about using epubls.siam.org? Contact sales@siam.org for a user guide and personal assistance!

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- 20% - 30% Off Registrations
- 80% Off Journals (up to 4)
- 95% Off e-Access to Journals
- Spouse may join as Associate Member
- *SIAM Unwrapped*

- Vote in SIAM Elections
- Eligible to Hold Office
- Eligible for Committee Appointments
- Nominate SIAM Fellows
- Be Nominated as a SIAM Fellow
- Eligible for Group Insurance
- Nominate 2 Students for Free Membership
- Qualifying Student Members can join 2 SIAGs for *free*!
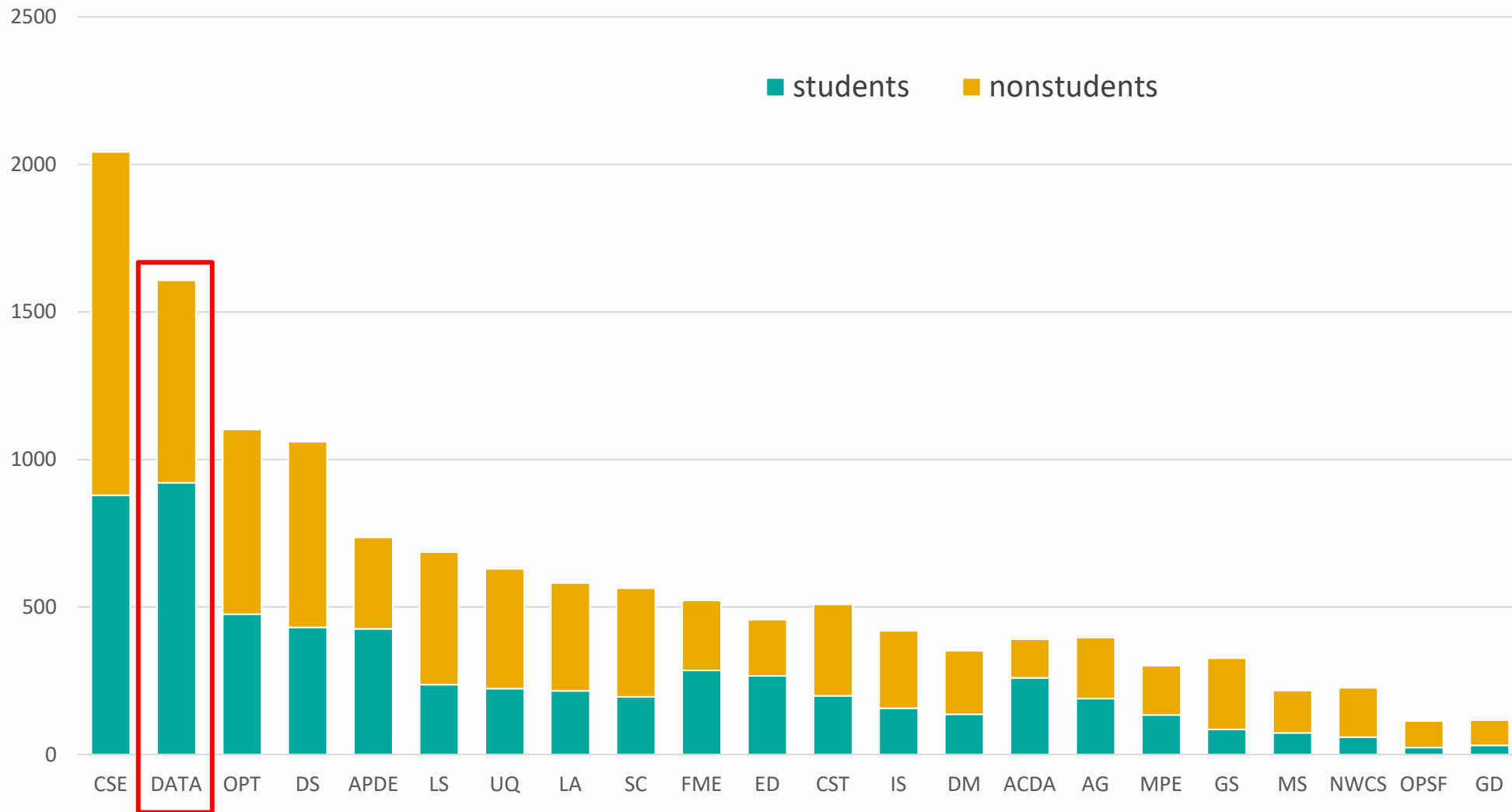- SIAG membership FREE for one year
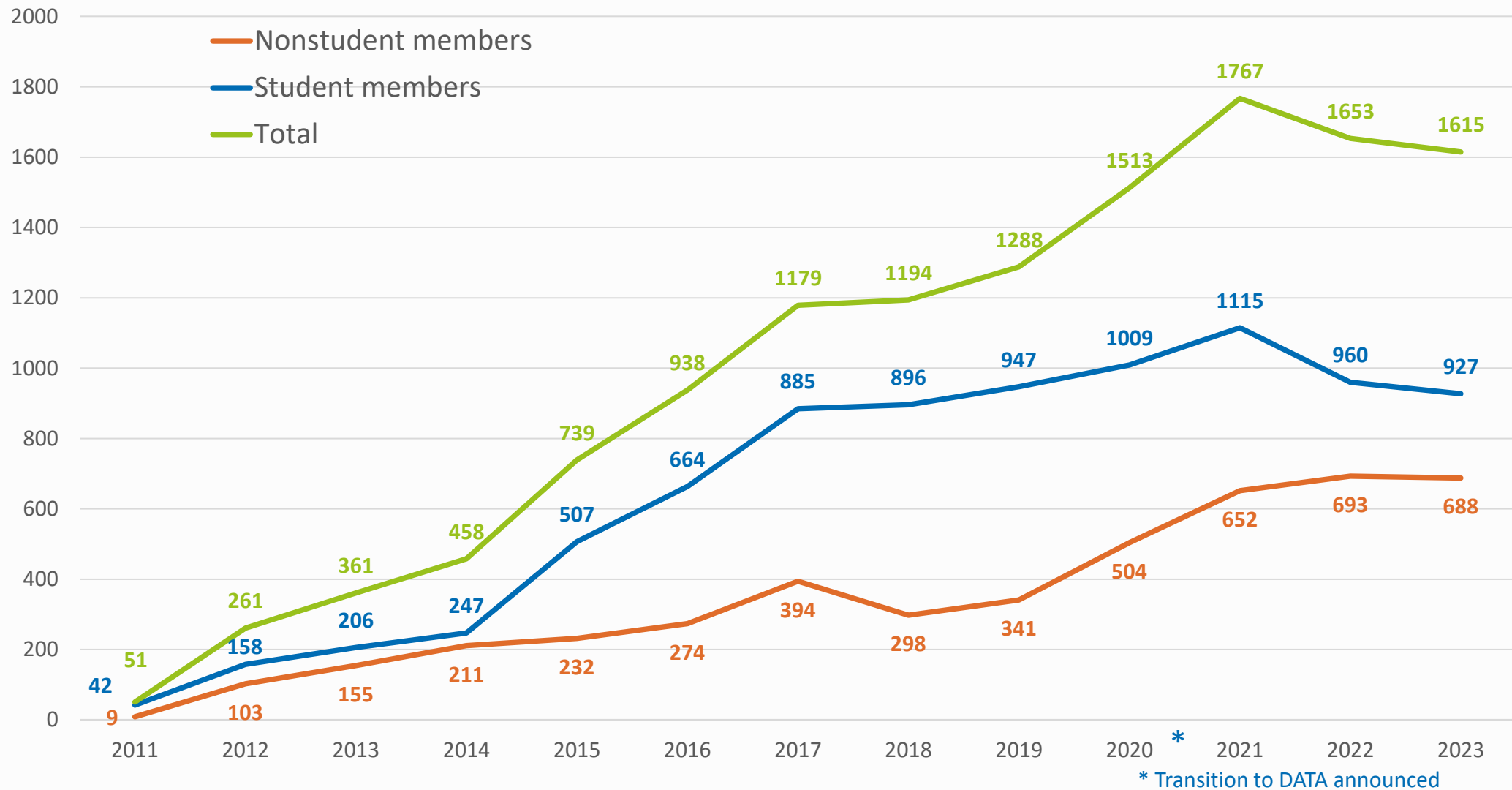
2024 SIAG/DATA

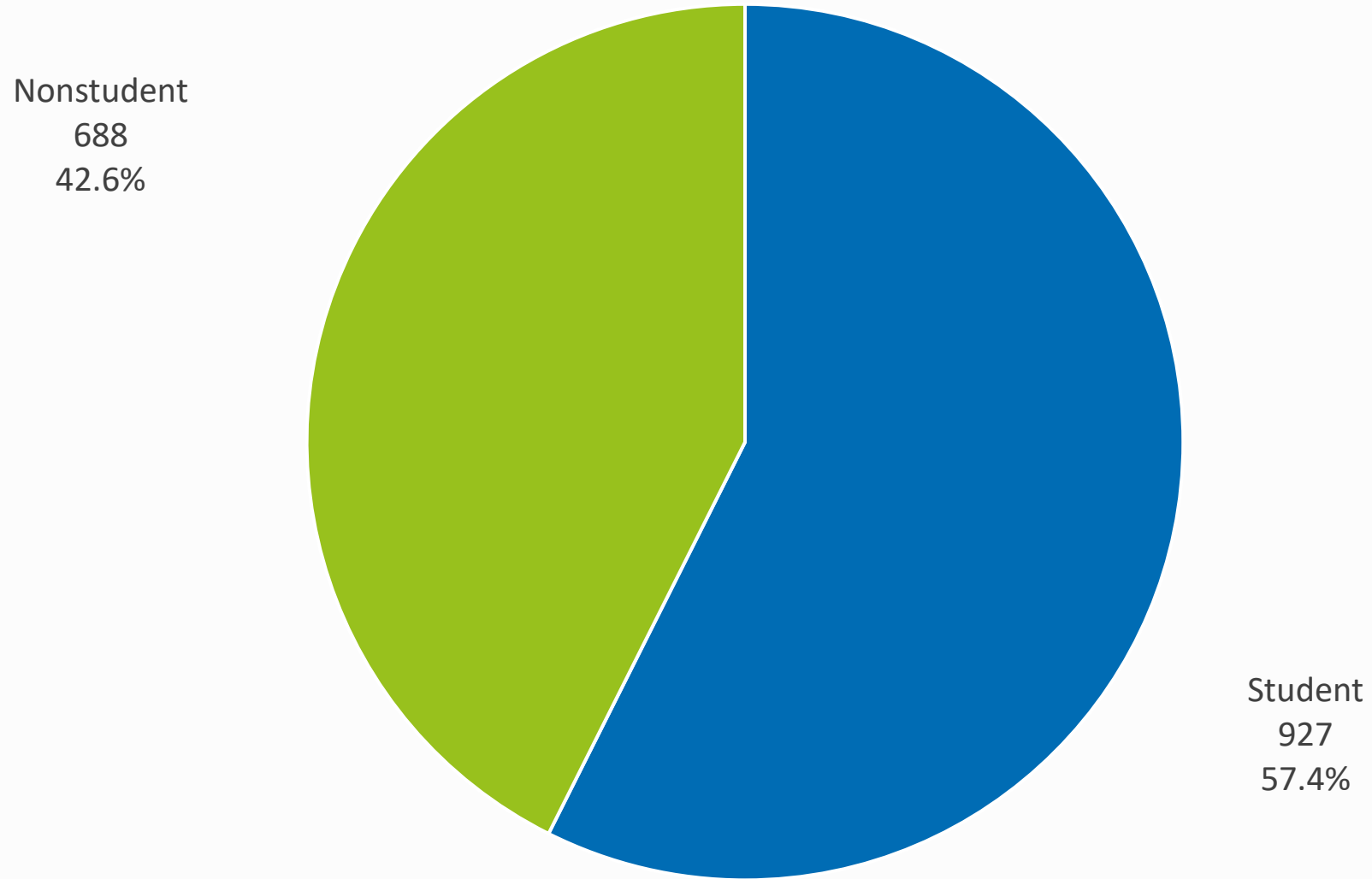## Membership Report

(data as of December 31, 2023)

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SIAG Overall Membership

SIAG/DATA Membership Demographics

2024 SIAG/DATA BUSINESS MEETING

SIAG/DATA Membership Demographics

Nonstudent
688
42.6%

Student
927
57.4%

SIAG/DATA Membership by Geography

	US		Non-US		Total	
Nonstudent	502	31%	186	12%	688	42.6%
Student	649	40%	278	17%	927	57.4%
Total	1151	71%	464	29%	1615	

SIAG/DATA Membership by Gender

Nonstudents

Woman
143
20.9%

Not Indicated
30
4.4%

Prefer Not to Disclose
17
2.5%

Nonbinary
3
<1%

Man
491
71.8%

Students

Woman
261
28.2%

Not Indicated
68
7.3%

Prefer Not to Disclose
11
1.2%

Nonbinary
8
.9%

Man
579
62.5%
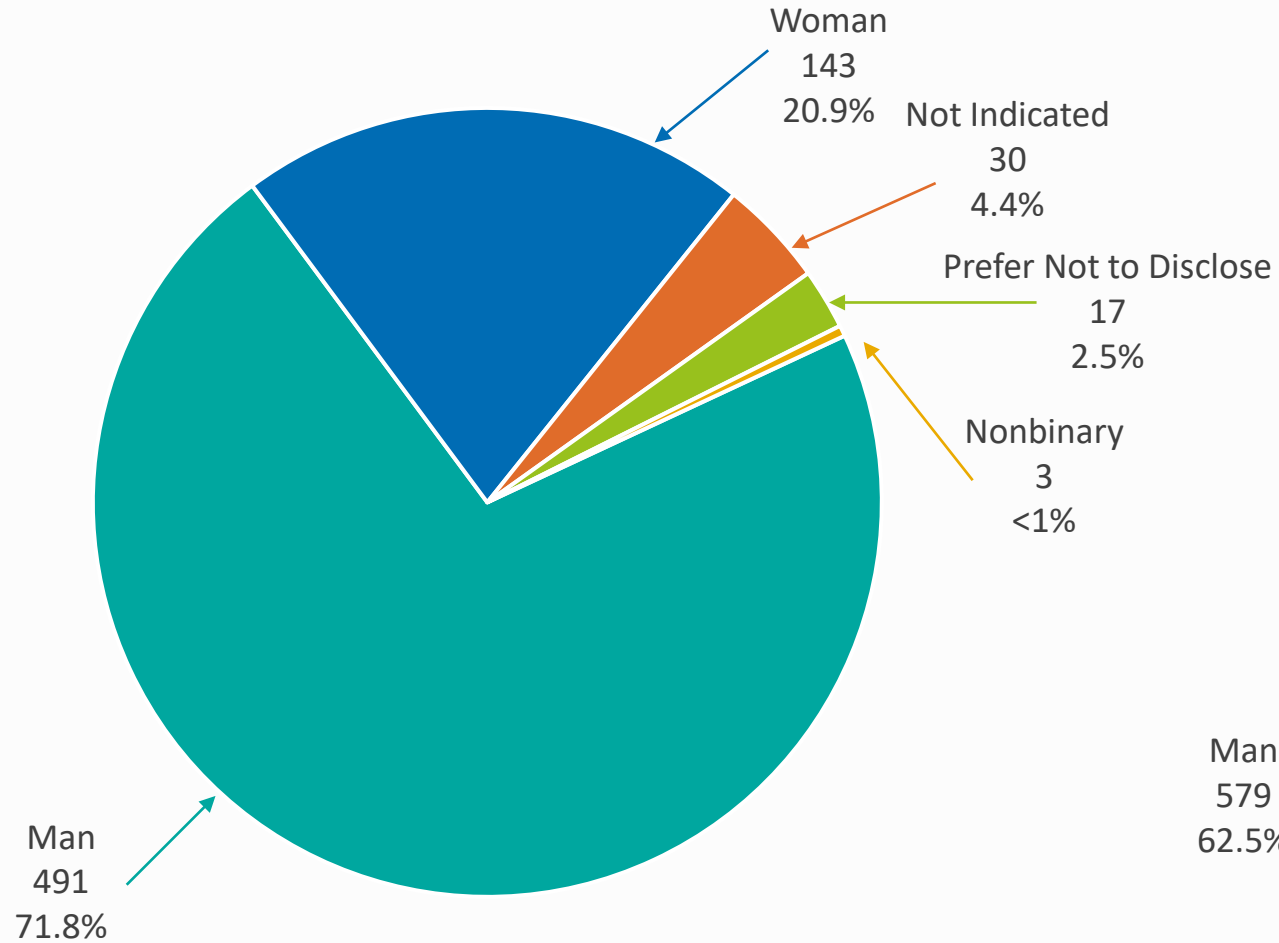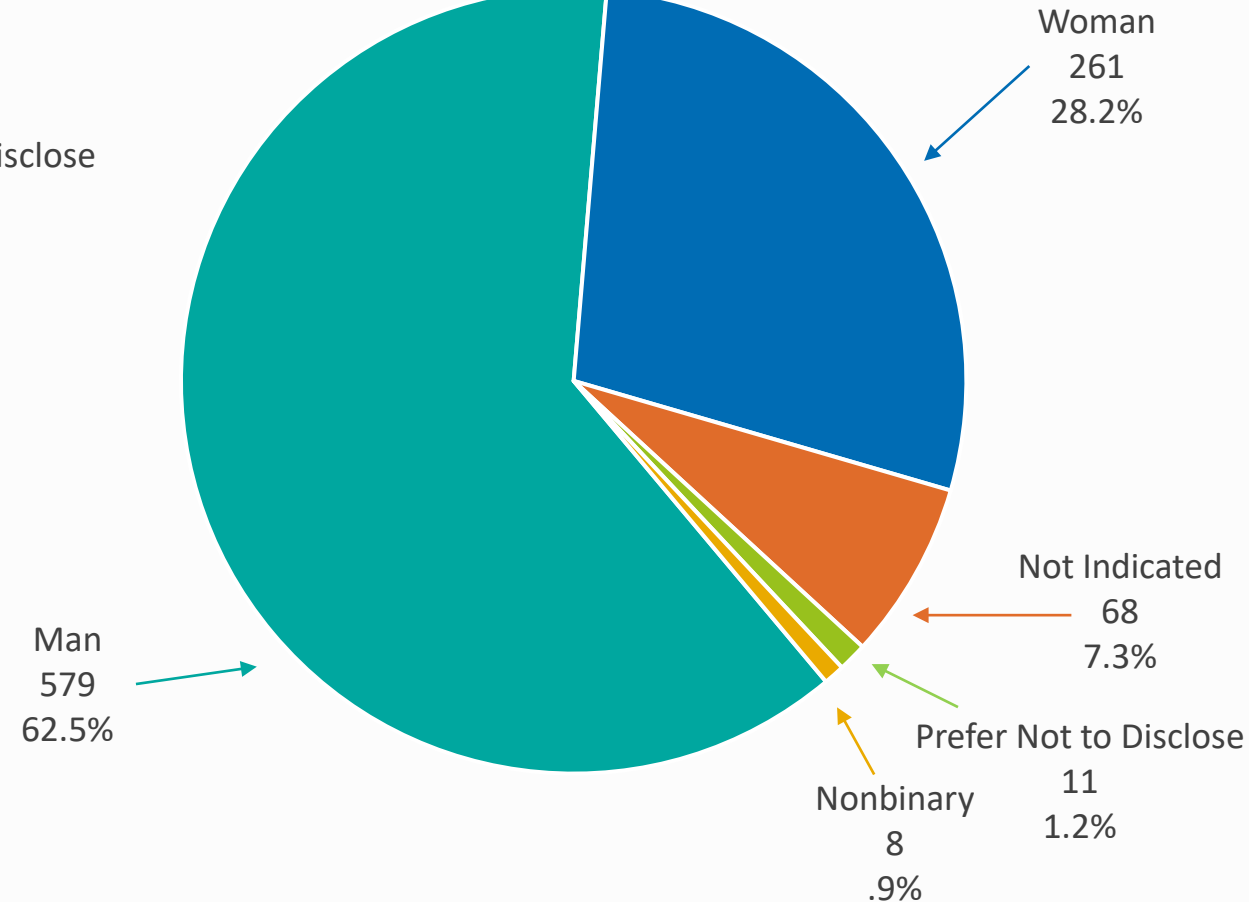
SIAG/DATA Membership by Employer Type

Industry
117
10.2%

Laboratory
59
5.2%

Government
27
2.4%

Other
31
2.7%

Academia
911
79.6%

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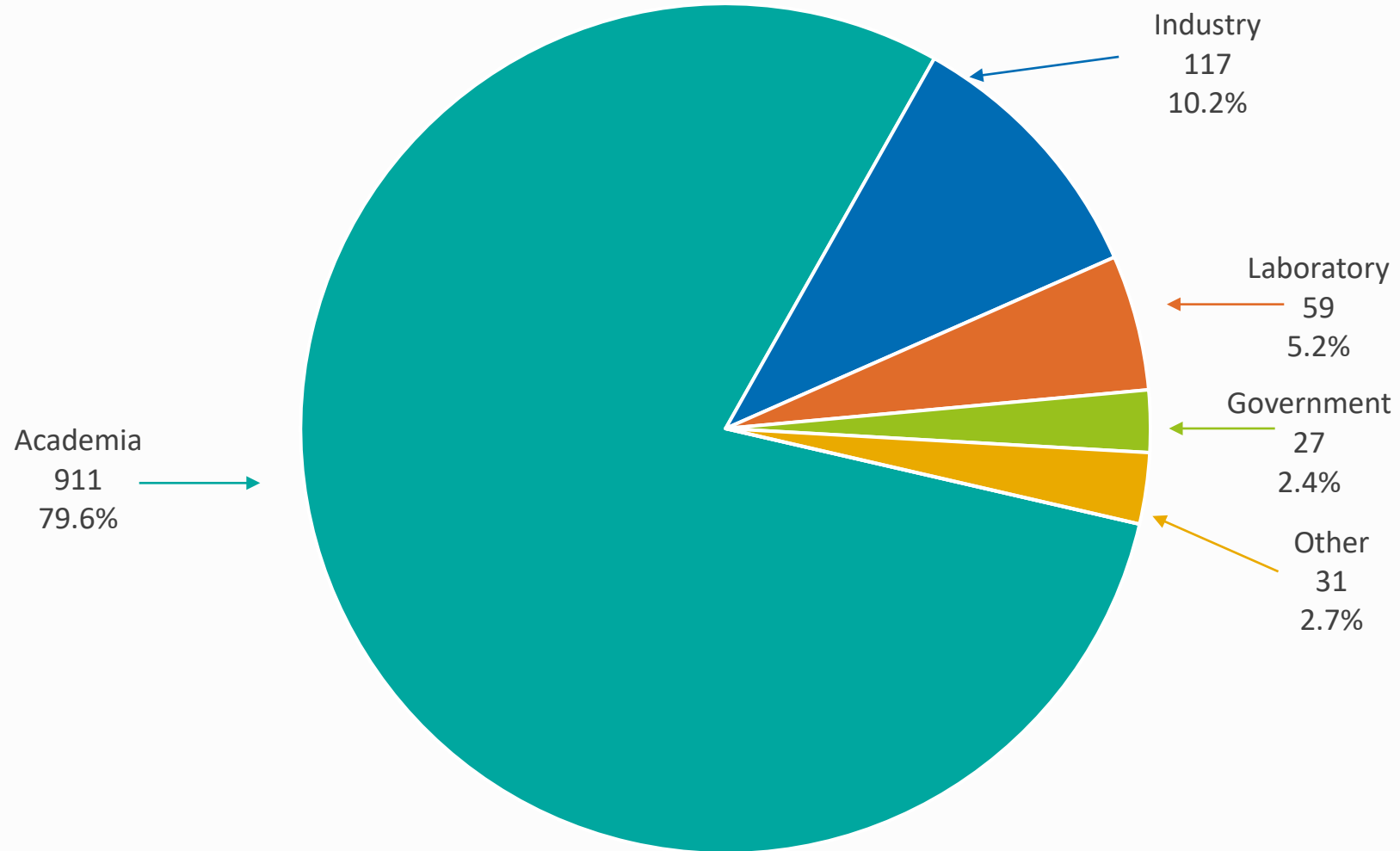
SIAG/DATA Membership by Department Type

Computer Science
69
14%

Other
26
5.3%

Statistics
28
5.7%

Op Research
27
5.58%

Other
(Physical Science)
9
1.8%

Physics
15
3%

Engineering
103
20.9%

Mathematics
215
43.7%
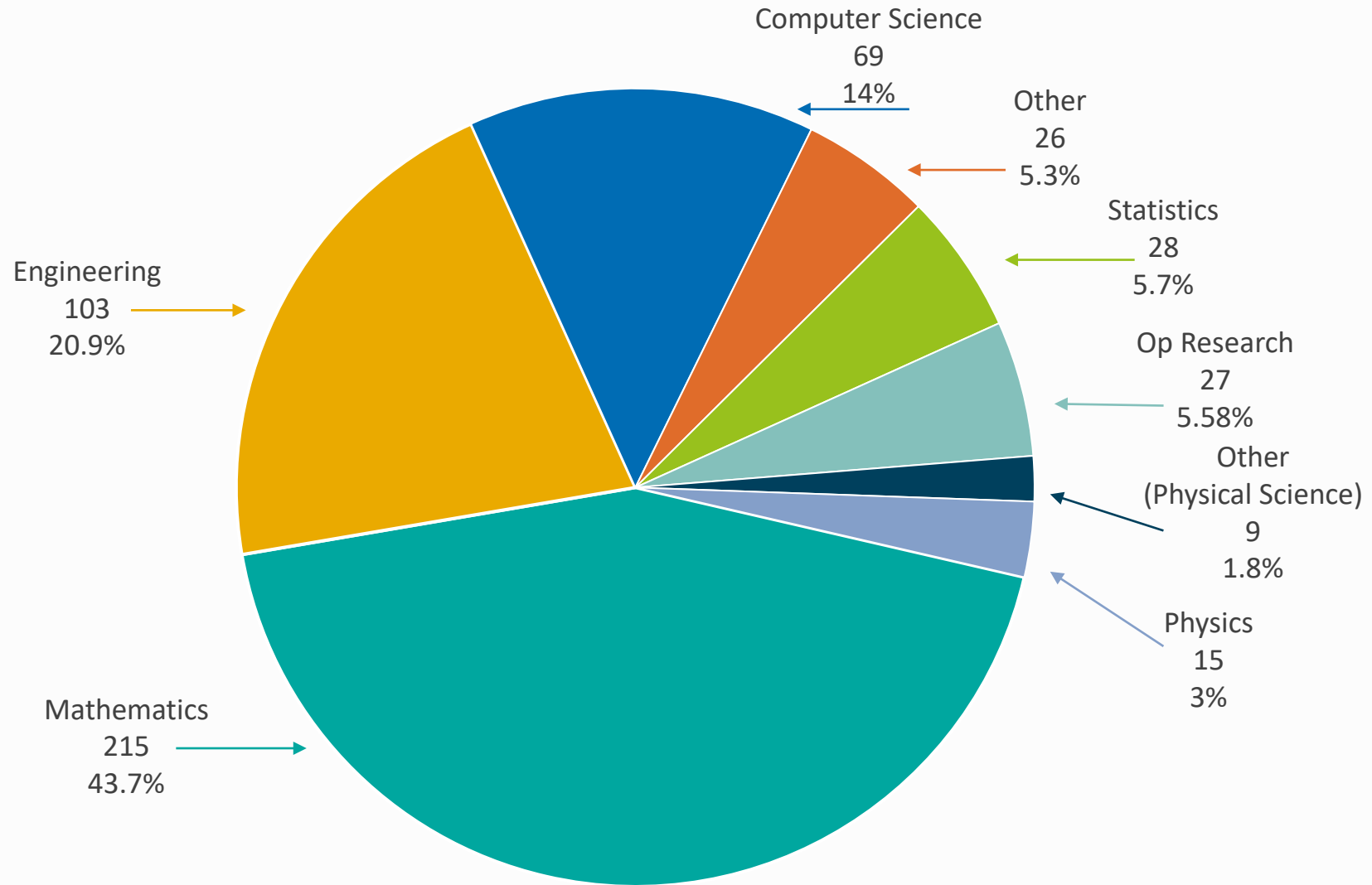
Other Business

Contacts

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Secretary — Jaime Haddock
jhaddock@g.hmc.edu

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