



# Unleashing the Power of Data Science

Supporting the Data-Driven  
Discovery Initiative

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From mapping the cosmos, to understanding how humans interact, to yielding new insights on literature, data science has the power to transform research and learning. New data sources and machine-learning techniques are enriching work across the humanities, social sciences, and natural sciences—and in many areas we are only beginning to get a glimpse of the potential these new tools have to offer.

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## Discovery across disciplines

To support the entire Penn Arts & Sciences community in exploring these partnerships and techniques, the School has launched a Data-Driven Discovery Initiative (DDD). DDD will act as a hub for data science education and research throughout the School. It will initiate new programs and provide a forum for interactions aimed at sparking discoveries by Penn faculty and students working across disciplinary boundaries, and will work in concert with the University's recently announced investment in data science. DDD's core activities include:

- The Data Science for Social Good program, which provides seed grants to fund early-stage projects that connect faculty, students, and city or global agencies through data-driven projects.
- A data science postdoctoral fellow program, which will enhance data science initiatives across disciplines. DDD will provide partial salary support for outstanding postdoctoral fellows in the natural and social sciences with expertise in data science.
- Summer Undergraduate Data Science Hangouts which bring together undergraduates involved in data-driven research across the humanities, natural sciences, and social sciences for regular sessions of talks, tutorials, and discussion.
- Bootcamps in coding and statistics to support undergraduates in developing these critical skills.



Irina Marinov, Associate Professor of Earth and Environmental Science, and Michael Weisberg, Bess W. Heyman President's Distinguished Professor of Philosophy, are among the recipients of the first round of Data Science for Social Good seed grants. Their project will map hot spots of climate change, exploring how their distribution will evolve, how global poverty and inequality will change in response, and whether indicators can predict socio-economic and political outcomes.

## Engaging Students

Penn undergraduates are at the frontiers of data science, exploring questions in a variety of areas and engaging with research topics previously inaccessible to them. DDD provides avenues for students to learn core data science skills, generating a new kind of expertise and worldview in students. Undergraduates will also have opportunities to participate in, and even lead, Data Science for Social Good projects.

Graduate students and postdoctoral fellows will be trained in new and rapidly evolving methodologies of data analysis. DDD will fund postdocs who are driving the research and working in multiple disciplines. A core group of students, postdocs, and faculty will interact regularly in a shared space and bring together visitors and Penn researchers to advance data-driven discovery.

## Faculty Leadership

The DDD initiative is being led by Bhuvnesh Jain, Walter H. and Leonore C. Annenberg Professor in the Natural Sciences in the Department of Physics and Astronomy, and Greg Ridgeway, Professor and Chair of Criminology and Professor of Statistics and Data Science.

Co-Director of the Center for Particle Cosmology, Professor Jain has worked extensively with big data gathered through major cosmological observation studies and led the Gravitational Lensing Group of the Dark Energy Survey. He cofounded the Summer Data Hangout in 2019.

Professor Ridgeway conducts data-intensive research to develop and apply new statistical and analytical methods to improve our understanding of crime and the functioning of the justice system. His methods have been put into place in police departments, Federal Public Defender Organizations, and drug treatment program evaluations.



Bhuvnesh Jain (Physics and Astronomy) and Greg Ridgeway (Criminology)

# Giving Opportunities

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The Data-Driven Discovery Initiative will act as a hub for data science education and research throughout the School.

The giving opportunities described here will support the Initiative's efforts to provide a forum for interactions, sparking discoveries by faculty and students working across disciplinary boundaries. All gifts are payable over five years.



## LEARNING AND LEADERSHIP

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### Support the Data Driven Discovery Opportunity Fund

Gifts of any size to the Opportunity Fund allow the Data Driven Discovery Initiative leaders to be agile and responsive to emerging needs and priorities with critical discretionary funds as this initiative launches and grows.

### Create Data Science for Social Good Seed Grants

This competitive program provides seed grants to fund early-stage projects that connect faculty, students, and city or global agencies through data-driven projects. It is collaborative with partners in Wharton and Engineering, and encourages community partnerships and impact in Philadelphia, nationally and globally. Named seed grants can be established with gifts of \$250,000–\$2M.

### Endow a Named Lecture or Event Fund

A gift of \$150,000 or more would facilitate an annual endowed lecture or event featuring a speaker, chosen by the Data Driven Discovery Initiative for his or her contributions to the field and topical to the interests of the time.

### Support Undergraduates by funding Data Science Hangouts

A gift to fund organized student hangout events and programs brings together undergraduates involved in data-driven research across the humanities, natural sciences, and social sciences for regular sessions of talks, tutorials, and discussion. A \$100,000 term gift supports five years of summer hangout basics. An endowed gift of \$500,000 would support student programming in perpetuity including things like hangouts, potential travel and other programming.

### Fund data science teaching and coursework with a gift of \$500,000–\$1 million

To build a cohort of data science experts engaged in hands-on teaching and training, a term gift of \$500,000 would fund the hiring of one expert lecturer and program manager. These funds would support teaching, advising, bootcamps in coding and statistics to develop critical skillsets, and more.

### Support graduate students through fellowships and research support

Graduate support ensures the continued exploration and growth of the academic field as well as deepening understanding outside of academia. A gift of \$700,000 would endow a 12-month fellowship for one graduate student. Term gifts of \$100,000 or more would fund summer Data Science graduate fellowships.





## FACULTY SUPPORT

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### Endow a Professorship with a gift of \$3 million

Endowing a professorship in perpetuity ensures that, for generations to come, a succession of academic pioneers will hold this named position, advance knowledge in their fields, and leave their marks on the most pressing issues of their times.

### Endow a Visiting Professorship with a gift of \$1.5 million

Visiting professors are prominent scholars from other universities who are invited to join the School for a semester or academic year. Through research and teaching, they engage our students and faculty, supporting cross-university collaboration and knowledge-sharing.

### Fund a Postdoctoral Fellowship with an endowed gift of \$1.5M

Postdoctoral fellows join Penn as early-career scholars. Fellows have the opportunity to pursue their own research, as well as to support graduate and undergraduate student work, collaborate with faculty, and help to organize program events and enhance data science initiatives across disciplines. A term gift of \$400,000 supports one fellow per year for five years; an endowed gift of \$1.5 million supports one fellow per year in perpetuity.

### Fund a Faculty Fellowship with a term gift of \$500,000

Faculty fellowships accomplish the same goal as an endowed professorship but on a temporary basis, and are integral to the School's ongoing effort to pursue scholars who focus on big ideas and generate collaboration across the disciplines. A term gift of \$500,000 would support one hire in a cluster search, named for 5 years in honor of the donor.

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*“We are excited by the vision of the DDD Initiative and look forward to seeing the impact this program will have on expanding our collective skills and expertise, and in integrating the power of data science across the arts and sciences. Combined with the new opportunities that will undoubtedly result from the Innovation in Data Engineering and Science (IDEAS) Initiative being launched in Engineering, this is an exciting time for data-driven research and learning at Penn.”*

### Steven J. Fluharty

Dean and Thomas S. Gates, Jr. Professor of Psychology, Pharmacology, and Neuroscience

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To learn more about supporting the Data-Driven Discovery Initiative, please contact Deb Rhebergen, Vice Dean for Advancement, at 215-898-9942 or [drheberg@sas.upenn.edu](mailto:drheberg@sas.upenn.edu).

