

Ikerbasque Fellow, Bilbao, Spain
(currently affiliated; on work-visa leave)
Born, currently in Denver, CO, USA

Mark C. Neyrinck, PhD
Data Science
Astronomy
Science-Art

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I develop models to fit the confusing universe of data around us in our human brains, to understand patterns and systems quantitatively and even artistically. For example, I have:

- Developed techniques to characterize uncertainties, and segment and understand cosmic structures. Also, patterns in images using machine-learning techniques, and even in toxicology datasets
- Developed origami, structural-engineering models of cosmic structures, explaining connections among the many branching patterns in nature. Research funded by Templeton Foundation
- Discovered that filaments between galaxies generally spin, adding to the standard picture of the cosmos
- Discovered the imprint that vast ‘supervoids’ leave on the microwave sky, developing along the way the standard cosmic void segmentation method
- Made many 3D visualizations, VR experiences for Oculus headsets; 3D printing and design

Data Science, Visualization, and Art

- Versed in practical AI/ML and other techniques for structure finding in spatial and image datasets, working with synthetic data company LexSet.ai
- Experienced in SQL, Python, JavaScript, Mathematica — worked for 7 years in Prof Alex Szalay’s group at Johns Hopkins, a pioneering group for SQL development, first in astronomy
- Segment featuring me about cosmic origami in **NOVA** “The Origami Revolution” <https://www.pbslearningmedia.org/resource/buac17-912-sci-ess-nvtorcsmicfold/wgbh-nova-the-origami-revolution-cosmic-folding/>
- Visualizing computational-toxicology relationships and uncertainties for the company SmarterSorting
- Astronomy and visualization consultant for upcoming map and website about a proposed (embargoed!) telescope for finding planets around other stars
- Designing an astronomical and river-network optical installation visualizing and embodying the drying climate, for the new Bayer Center at the Aspen Institute
- Google HQ Science Foo Camps (Google/Nature magazine/O’Reilly Media)
- Produced full-dome movie of cosmic structure formation, Groningen, the Netherlands

Employment/Education highlights

- BA in Physics, Cambridge Univ, Univ of Chicago, 2000
- PhD in Astrophysics, Univ of Colorado Boulder, 2005
- Postdoc, Inst for Astronomy, U Hawaii, 2005-8
- Research Scientist, Physics Dept, Johns Hopkins Univ, 2008-2016
- Postdoc, Durham Univ, England, 2016-7
- Ikerbasque Fellow (~Asst Research Professor), U Basque Country, Bilbao, Spain, 2018-2022
- Scientific Advisory Board, Titan Space Technologies, 2021-2

Selected Popular Media Attention for Work

- [Cosmic filaments may be the biggest spinning objects in space](#), 2021, *Science News*
- [“The Cosmic Spiderweb on Dark-Matter-Haloes’ Eve”](#) invited blog post, *The Huffington Post*
- [“How to Make an Origami Universe,”](#) *New Scientist*

