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Mark C. Neyrinck
Curriculum Vitæ

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Born in Colorado, USA

Principal Achievements

- I developed engaging **“origami”** and **“cosmic spiderweb”** descriptions of **cosmic structure formation**, which helps to understand information loss in the cosmos, and how angular momentum in a galaxy is related to its environment, leading to involvement in a NOVA program
- I pioneered **techniques to detect and analyze cosmic voids** for cosmological constraints. With my premier void-finder ZOBOV, we made the **first detection of the cold imprints of voids** on the **cosmic microwave background**, a **sign of dark energy**.
- I discovered a simple way to enhance the power of conventional large-scale-structure studies: Gaussianizing transforms. This will lead to a **deeper understanding, and tighter constraints, on cosmic structure formation and the cosmological and galaxy-formation physics** driving it.

Popular Media Attention for Work

[Interview](#), SciArt Magazine, August 2020

[“The Cosmic Web that Connects Galaxies Together May Be Spinning,”](#) *New Scientist*, 16 June 2020

[Paper-folding, dark matter and the structure of the universe](#), Science Gallery Dublin podcast, Apr 2020

Interview and segment about origami and cosmology in NOVA episode “The Origami Revolution,” <https://rmpbs.pbslearningmedia.org/resource/buac17-912-sci-ess-nvtorcosmicfold/wgbh-nova-the-origami-revolution-cosmic-folding/>

[“The Cosmic Spiderweb on Dark-Matter-Haloes’ Eve”](#) invited blog post, *The Huffington Post*

[“The Origami Cosmic Web”](#) article, *The Paper* (OrigamiUSA magazine, circ. 1800), Autumn 2016

Quoted in [“Vast cosmic voids merge like soap bubbles”](#), Cowen, Ron, *Nature*, Oct 15, 2015

[“How to Make an Origami Universe,”](#) Battersby, Stephen, *New Scientist*, 20 Dec 2014

Quoted in [“Shadow of a Supervoid,”](#) Maria Temming, *New Scientist*, 24 June 2014

[“The Origami Cosmic Web of Galaxies,”](#) invited blog post, *The Huffington Post*

[“Dark energy ‘imaged’ in best detail yet,”](#) Merali, Zeeya, *New Scientist*

[“Dark Energy’s Early Fingerprints,”](#) Carlisle, C. M., *Sky & Telescope* online

Education

Ph.D. Astrophysics, University of Colorado at Boulder (Thomas Award)

Ph.D. Thesis: “Illuminating the Tips of Dark-Matter Icebergs”

Advisors: Andrew J. S. Hamilton, Nickolay Y. Gnedin

M.S. Astrophysics, University of Colorado at Boulder (High Pass)

B.A. Physics, w/spec. in Astr, University of Chicago (Honors; Lewis Prize)

Mathematics, Part IB, Pembroke College, Cambridge University

Selected Awards and Grants

PI, Templeton New Frontiers in Astronomy and Cosmology Award/Grant

Only non-faculty recipient. “Information Flowing and Folding into Complexity”

Recipient, JHU Digital Media Center Creative Use of Technology Grant, funding a

“folding lab” in my “Origami Mathematics and Cosmology” class

Collaborator, NASA Grants, “Reconstructing Information in Large-Scale Structure via Logarithmic

Mapping,” “Detecting Dark Energy from WMAP and Pan-STARRS1 Cross-correlations”

Richard N. Thomas Award, annual award for the most outstanding research by a graduating University of Colorado Astrophysics PhD student

Supercomputer Allocations, NCSA/XSEDE

Lewis Prize, for the “**best graduating senior in physics**,” **University of Chicago**

Donnelley Fellowship for one year at Cambridge University, awarded to one undergraduate per year at the University of Chicago

Employment

Ikerbasque Fellow , Univ of the Basque Country, Spain	<i>Spring 2018-Present</i>
Postdoctoral Researcher , Durham University	<i>Summer 2016-Winter 2017</i>
Asst, Assoc. Research Scientist , Johns Hopkins	<i>Summer 2011-Summer 2016</i>
Visiting Scientist , Institut d’Astrophysique de Paris	<i>Jan-July 2016</i>
Course Instructor , “Origami Mathematics and Cosmology”, JHU	<i>Intersession, Jan 2015</i>
W. M. Keck Fellow , Johns Hopkins University	<i>Fall 2008-Summer 2011</i>
Postdoctoral Researcher , Institute for Astronomy, U. of Hawaii	<i>Fall 2005-Summer 2008</i>
Course Instructor , “Black Holes”, APS Dept., U. of Colorado	<i>Summer 2005</i>
Research Assistantship , JILA, Univ. of Colorado	<i>Summer 2000-Fall 2004</i>
Teaching Assistantship , APS Dept., U. of Colorado	<i>Fall 2000, Fall 2002, Spring 2005</i>
Teaching Assistantship , Math Dept., U. of Chicago	<i>1997-1998, 1999-2000</i>

Selected Presentations, Workshops, and Invitations

Visualizing, Tactilizing, and Embodying the Cosmic Web, Cosmic Flows, South Africa	<i>Feb 2020</i>
The Cosmic Web in the Local Universe, Leiden Cosmic Web Workshop	<i>Jan 2020</i>
Panel, As Above As Below Cosmology/Neuroscience/Art Exhibition	<i>Oct 2019</i>
Non-Standard Probes of Cosmology, Aspen Center for Physics	<i>Aug-Sep 2019</i>
The Cosmic Web: from Galaxies to Cosmology, Edinburgh	<i>June 2019</i>
Colloquium, University of Lyon, France	<i>May 2019</i>
Talk, University of Barcelona	<i>Apr 2019</i>
Talk, Ibericos (Iberian Cosmology Conference), Bilbao	<i>Apr 2019</i>
Invitation, talks at “Méthodes Analytiques, Statistiques et Numériques” trimester Institut Henri Poincaré, Paris	<i>Sep-Dec 2018</i>
Invitation, 7th Origami Science Mathematics and Education conference, Oxford	<i>Sep 2018</i>
Origami galaxy folding workshop, Dragon Boat Festival, Denver, CO	<i>Jul 2018</i>
Invitation, “The Information Universe 2” conference, Groningen	<i>Jul 2018</i>
Invitation, “Science Foo Camp”, Google/Nature magazine/O’Reilly Media science and science communication conference/“camp” at Google X	<i>June 2018</i>
Inst of Physics Symposium, Sunderland, UK, “Bringing Physics into the Human Experience”	<i>Apr 2018</i>
Exploiting Extra-galactic Synergies between WFIRST and Future Facilities workshop	<i>Mar 2018</i>
SPHEREx Second Community Workshop	<i>Feb 2018</i>
Talk at Santa Fe Institute	<i>Jan 2018</i>
Talk at NYU CCCP	<i>Nov 2017</i>
Inst of Physics Symposium, London, “Bringing Physics into the Human Experience”	<i>Oct 2017</i>
Seminar: Vorticity in Large-Scale Structure, Aspen Center for Physics meeting, “Vorticity in the Universe”	<i>Sep 2017</i>
Seminar: Origami-Folding the Local Universe , Paper Studio, Northumbria University	<i>Apr 2017</i>
Talk, Virgo Consortium Meeting	<i>Dec 2016</i>
Seminar, Institute of Theoretical Astrophysics, University of Oslo	<i>Nov 2016</i>
Invited speaker, BAO & RSD: Dark Light on Obscure Acronyms, Sexten Center for Astrophysics, Sesto, Italy	<i>July 2016</i>
Talk at Statistical Challenges in 21st Century Cosmology, Chania, Greece	<i>May 2016</i>
Invited speaker, Statistics of Extrema in Large Scale Structure, Leiden	<i>March 2016</i>

Talk, “Local Group Astrostatistics” workshop, Ann Arbor, MI *June 2015*
 Invited speaker, “Advanced Workshop on Cosmological Structures from Reionization to Galaxies: Combining Efforts from Analytical and Numerical Methods,” Trieste, Italy *May 2015*
 Invited speaker, National Society of Black Physicists conference, Baltimore, MD *Feb 2015*
 Sloan 3 BOSS meeting *Dec 2014*
 Invited CITA Seminar *November 2014*
 “The Galaxy-Halo Connection Across Cosmic Time” workshop, Aspen Center for Physics *September 2014*
 Plenary talk, co-organizer of “Cosmic Voids in the Next Generation of Galaxy Surveys” workshop, Ohio State University *August 2014*
 Talk at 6OSME: The 6th International Meeting on Origami in Science, Mathematics, and Education, Tokyo *August 2014*
 Seminar, University of Nagoya, Japan *August 2014*
 Seminar, Institute for Astronomy, Hawaii *August 2014*
 Invited talk, Collisionless Fluids Workshop, IAP, Paris *July 2014*
 Invited talk, IAU Symposium 308: The Zel’dovich Universe, Tallin, Estonia *June 2014*
 LSST Dark Energy Science Collaboration meeting, Philadelphia *June 2014*
 Invited talk, IAU Symposium 306: Statistical Challenges in 21st Century Cosmology, Lisbon, Portugal *May 2014*
 Invited talk, “Tracing the Cosmic Web,” Lorentz Center, Leiden, the Netherlands *Feb 2014*
 SDSS BOSS collaboration meeting, Berkeley *Dec 2013*
 CASA/JILA Astrophysics Lunch Seminar, U of Colorado, Boulder *Aug 2013*
 Talk, Ripples in the Cosmos, Durham, UK *Jul 2013*
 Invited Talk, Darklight Dark Energy/Matter Workshop, Varenna, Italy *June 2013*

Professional and Departmental Service

LSST-Dark Energy Science Collaboration full member *2014-Present*
 JHU Cosmology Journal Club (Cosmojo) founding and weekly organization *2009-2015*
 SOC, “Cosmic Voids in the Next Generation of Galaxy Surveys” workshop, Ohio State University *Aug 2014*
 NASA Astrophysics Theory and Data Analysis Program panels (ATP, ADAP) *2011, 2012, 2014*
 Head Organizer for IDIES (Institute for Data-Intensive Engineering and Science) Inaugural Symposium/Alex Szalay’s 60th Birthday “Szalaybration” *Aug 2009*
 Colloquium Committee, UH Institute for Astronomy *2007-2008*

Outreach, Science/ Art Activities (hyperlinks in blue)

Origami and Fabric Cosmic Web Workshops, INVISIBLE exhibition, Science Gallery Dublin *Spring 2020*
 Immersive VR experience and Cosmic Web Workshops about neuron/cosmic web growth for “As Above As Below,” <http://asaboveasbelow.com>, a neuroscience/cosmology/art exhibition in San Francisco *Oct-Dec 2019*
 Public JAKIN-MINA (Basque Academy of Sciences) lecture for students about the patterns in nature, in the cosmos, and in art, with an experiential origami activity, Bilbao, Spain *Nov 2019*
 Origami and Fabric Cosmic Web Workshops, DARK MATTER exhibition, Science Gallery London *June 2019*
 Involvement in “Cosmic Collisions: a summer solstice exploration of creation”, art-science event, Crawick Multiverse, Sanquhar, Scotland *Jul 2017*
 Art seminar: [Origami-Folding the Local Universe](#), Paper Studio, Northumbria Univ *Apr 2017*

Involvement in NOVA program “The Origami Revolution”	2017
Involvement in “Celebrate Science,” Durham University	2016-2017
JHU Physics & Astronomy Dept Physics Fair contributions and volunteering	2010-2015
“The Bridge” Resident, SciArt Center	2016-2017
Involvement in “The Origami Code” documentary: interview and making animations	2015
JHU Physics & Astronomy Dept Physics Fair contributions and volunteering	2009-2014
Development of “Fold Your Own Galaxy” origami activity, and “Fold Your Own Universe” NASA SpaceApp	
USA Science & Engineering Festival (Wash, DC) contributions and volunteering	Oct 2010
UH Institute for Astronomy Open Houses	2006-2008
Supervising the “Astronomy” and “Reach for the Stars” events for Colorado Science Olympiad (middle and high school) competitions	2001, 2003, 2004, 2005
Running open houses at Boulder’s Sommers-Bausch Observatory	

Publications: H-index 30, > 4940 total citations (according to [Google Scholar](#))

Submitted and Accepted Refereed Publications ([blue](#) text is linked to ADS abstracts)

1. **Neyrinck** et al. (24 authors), SciArt Magazine, Feb 2020, [Exploring Connections Between Cosmos & Mind Through Six Interactive Art Installations in "As Above As Below"](#)
2. Tosone, **Neyrinck**, et al., 2020, MNRAS, in press
[Beyond the Lognormal Approximation: a General Simulation Scheme](#)
3. Xia, **Neyrinck**, et al., 2020, Nature Astronomy, submitted
[Intergalactic Filaments Spin](#)
4. Steinhardt, Jauzac, ... **Neyrinck**, et al., 2020, ApJS, 247, 64
[The BUFFALO HST Survey](#)
5. Mao, ... **Neyrinck** et al., 2020, MNRAS, submitted
[Baryon acoustic oscillations reconstruction using convolutional neural networks](#)
6. **Neyrinck** et al., 2020, Open Journal of Astronomy
[Halo Spin from Primordial Inner Motions](#)
7. **Neyrinck** et al., 2020, SciArt Magazine, Feb 2020
[Exploring Connections Between Cosmos & Mind Through Six Interactive Art Installations in "As Above As Below"](#)
8. Aragon-Calvo, M., **Neyrinck**, Mark C., Silk, J., 2019, Open Journal of Astronomy
[Galaxy Quenching from Cosmic Web Detachment](#)
9. **Neyrinck** et al., 2018, MNRAS, 478, 2495
[Density-dependent clustering: I. Pulling back the curtains on motions of the BAO peak](#)
10. **Neyrinck**, 2018, proc of the 7th meeting of Origami, Science, Mathematics and Education
[The Cosmic Spiderweb and General Origami Tessellation Design](#)
11. **Neyrinck**, in 2018, Triscott & Crisp, ed., *The Live Creature and Etherial Things: Physics in Culture*
12. **Neyrinck** et al., 2018, Roy Soc Open Science, Volume 5, Issue 4, id.171582
[The cosmic spiderweb: equivalence of cosmic, architectural and origami tessellations](#)
13. Raccanelli, ... **Neyrinck** et al., 2018, Physics of the Dark Universe, Volume 19, p. 109-123.
[Doppler term in the galaxy two-point correlation function: wide-angle, velocity, Doppler lensing and cosmic acceleration effects](#)
14. Libeskind, ... **Neyrinck**, et al., 2018, MNRAS, 473, 1195
[Tracing the cosmic web](#)
15. Ivkin, ... **Neyrinck**, Szalay et al., 2018, Astronomy & Computing, Volume 23, p. 166-179.
[Scalable Streaming Tools for Analyzing N-body Simulations: Finding Halos and Investigating Excursion Sets in One Pass](#)
16. Falck, ..., **Neyrinck**, et al., 2017, ApJ, 837, 181
[The Effect of Corner Modes in the Initial Conditions of Cosmological Simulations](#)

17. Cai, **Neyrinck**, Mao, Peacock, Szapudi & Berlind, 2016, MNRAS, 466, 3364
[The lensing and temperature imprints of voids on the Cosmic Microwave Background](#)
18. Mao, Berlind, Scherrer, **Neyrinck**, et al., 2017, ApJ, 835, 160
[Cosmic Voids in the SDSS DR12 BOSS Galaxy Sample: The Alcock-Paczynski Test](#)
19. Mao, Berlind, Scherrer, **Neyrinck**, et al., 2017, ApJ, 835, 161
[A Cosmic Void Catalog of SDSS DR12 BOSS Galaxies](#)
20. Kitaura, F-S, ... **Neyrinck**, Mark, et al., 2016, MNRAS, 456, 4156
[The clustering of galaxies in the SDSS-III Baryon Oscillation Spectroscopic Survey: mock galaxy catalogues for the BOSS Final Data Release](#)
21. McCullagh, N., **Neyrinck**, Mark, Norberg, P., Cole, S., 2016, MNRAS, 457, 3652
[Recovering dark-matter clustering from galaxies with Gaussianization](#)
22. **Neyrinck**, Mark C. 2016, MNRAS, 460, 816
[Tetrahedral collapse: a rotational toy model of simultaneous dark-matter halo, filament and wall formation](#)
23. Zaoxing, L., ... **Neyrinck**, Mark, et al. (4th of 10) 2015 IEEE 11th International Conference on e-Science, pp.342-351, Aug. 31 2015-Sept. 4 2015, doi: 10.1109/eScience.2015.73
[Streaming Algorithms for Halo Finders](#)
24. **Neyrinck**, Mark C. 2016, MNRAS Letters, 455, 11
[Truthing the stretch: Non-perturbative cosmological realizations with multiscale spherical collapse](#)
25. Alam, Shadab, ... **Neyrinck**, Mark C., et al. 2015, ApJS, 219, 12
[The Eleventh and Twelfth Data Releases of the Sloan Digital Sky Survey: Final Data from SDSS-III](#)
26. Achitouv, Ixandra, **Neyrinck**, Mark; Paranjape, Aseem, 2015, MNRAS, 451, 3964
[Testing spherical evolution for modelling void abundances](#)
27. Aragon-Calvo, M., **Neyrinck**, Mark C., Silk, J., 2014, MNRAS, submitted
[Star Formation Isochrone Surfaces: Clues on Star Formation Quenching in Dense Environments](#)
28. Yang, F. Y., **Neyrinck**, Mark C., ... Silk, J., 2014; MNRAS, 451, 360
[Warmth Elevating the Depths: Shallower Voids with Warm Dark Matter](#)
29. **Neyrinck**, Mark C., 2015; MNRAS Letters, 452, 26
[Kolmogorov complexity in the Milky Way and its reduction with warm dark matter](#)
30. **Neyrinck**, Mark C., 2015; accepted after refereeing to Origami⁶: Proceedings of the 6th International Meeting on Origami in Science, Mathematics, and Education.
[Cosmological Origami: Properties of Cosmic-Web Components when a Non-Stretchy Dark-Matter Sheet Folds](#)
31. Hoffmann, K.; ... **Neyrinck**, Mark C., et al. (17 authors), 2014, MNRAS, 442, 1197
[Subhaloes gone Notts: subhaloes as tracers of the dark matter halo shape](#)
32. **Neyrinck**, Mark C.; Aragon-Calvo, M. A.; Jeong, D.; Wang, X., 2014, MNRAS, 441, 646
[A halo bias function measured deeply into voids without stochasticity](#)
33. Cai, Y-C; **Neyrinck**, Mark C.; et al. (5 authors), 2014, ApJ, 786, 110
[A Possible Cold Imprint of Voids on the Microwave Background Radiation](#)
34. Cai, Y-C; ... **Neyrinck**, Mark C.; et al. (5 authors), 2014, MNRAS, 439, 2978
[The Integrated Sachs-Wolfe effect in f\(R\) gravity](#)
35. Wang, Xin, ... **Neyrinck**, Mark et al. (5 authors), 2014, ApJ, 793, 58
[Kinematic Morphology of Large-Scale Structure: Evolution from Potential to Rotational Flow](#)
36. Pujol, A., ..., **Neyrinck**, Mark C., et al., 2014, MNRAS, 438, 3205
[Subhaloes gone Notts: the clustering properties of subhaloes](#)
37. Knebe, A., ..., **Neyrinck**, Mark C., et al. (21 of 35 authors), 2013, MNRAS, 435, 1618
[Structure finding in cosmological simulations: the state of affairs](#)
38. **Neyrinck**, Mark C. & Yang, L. F., 2013, MNRAS, 433, 1628
[Ringing the initial Universe: the response of overdensity and transformed-density power spectra to initial spikes](#)
39. Onions, J., ..., **Neyrinck**, Mark C., et al. (12th of 18 authors), 2013, MNRAS, 429, 2739.
[Subhaloes gone Notts: spin across subhaloes and finders](#)
40. Hernandez-Montenegro, C., ..., **Neyrinck**, Mark C., et al. (7th of 15 authors), MNRAS, 438, 1724.
[The SDSS-III Baryonic Oscillation Spectroscopic Survey: Constraints on the Integrated Sachs Wolfe effect](#)

41. McCullagh, N., **Neyrinck**, Mark C., et al. (4 authors), ApJ Letters, 763, 14.
[Removing BAO-peak shifts with local density transforms](#)
42. **Neyrinck**, Mark C., 2013, MNRAS, 428, 141
[Quantifying distortions of the Lagrangian dark-matter mesh in cosmology](#)
43. **Neyrinck**, Mark C., 2012, MNRAS, 427, 494.
[Origami constraints on the initial-conditions arrangement of streams and caustics](#)
44. Onions, J., ... **Neyrinck**, Mark C. et al. (17 authors), 2013, MNRAS, 429, 2739
[Subhaloes gone Notts: Spin across subhaloes](#)
45. Falck, B., **Neyrinck**, Mark C., & Szalay, A, 2012, ApJ, 754, 126
[ORIGAMI: Delineating haloes using phase-space folds](#)
46. Onions, J., ... **Neyrinck**, Mark C. et al. (17 authors), 2012, MNRAS, 423, 1200
[SubHaloes Going Notts: The SubHalo-Finder Comparison Project](#)
47. Carron, J., & **Neyrinck**, Mark C., 2012, ApJ, 750, 28
[On the inadequacy of N-point correlation functions to describe nonlinear cosmological fields: Explicit examples and connection to simulations](#)
48. Falck, B., **Neyrinck**, Mark C., Lavaux, G, Aragon-Calvo, M. & Szalay, A, 2012, ApJ, 745, 17.
[Straightening the Density-Displacement Relation with a Logarithmic Transform](#)
49. **Neyrinck**, Mark C., 2011, ApJ, 742, 91
[Rejuvenating the Matter Power Spectrum III: The Cosmology Sensitivity of Gaussianized Power Spectra](#)
50. **Neyrinck**, Mark C., 2011. ApJ, 736, 8.
[Removable Matter-power-spectrum Covariance from Bias Fluctuations](#)
51. Wang, X., **Neyrinck**, Mark C., et al. (8 authors), 2011. ApJ, 735, 32.
[Perturbation Theory of the Cosmological Log-density Field](#)
52. Knebe, A., ... **Neyrinck**, Mark C., et al. (37 authors), 2011. MNRAS, 415, 2293.
[Haloes gone MAD: The Halo-Finder Comparison Project](#)
53. Tian, H.J., **Neyrinck**, Mark C., Budavári, T., & Szalay, A.S., 2011. ApJ, 728, 34.
[Redshift-Space Enhancement of Line-of-Sight Baryon Acoustic Oscillations in the SDSS Main-Galaxy Sample](#)
54. **Neyrinck**, Mark C., Szapudi, I., & Szalay, A.S., 2011. ApJ, 731, 116.
[Rejuvenating Power Spectra II: the Gaussianized galaxy density field](#)
55. Granett, B. R., Szapudi, I., & **Neyrinck**, Mark C., 2010. ApJ 714, 825.
[Galaxy Counts on the Cosmic Microwave Background Cold Spot](#)
56. Granett, B. R., **Neyrinck**, Mark C., & Szapudi, I., 2009. ApJ 701, 414.
[A Map of the Integrated Sachs-Wolfe Signal from Luminous Red Galaxies](#)
57. **Neyrinck**, Mark C., Szapudi, I., & Szalay, A. S., 2009. ApJ 698, L90.
[Rejuvenating the Matter Power Spectrum: Restoring Information with a Logarithmic Density Mapping](#)
58. Granett, B. R., **Neyrinck**, Mark C., & Szapudi, I., 2008. ApJ 683, L99.
[An Imprint of Superstructures on the Microwave Background due to the Integrated Sachs-Wolfe Effect](#)
59. Colberg, J. M., ... **Neyrinck** M. C., et al., 2008. MNRAS 387, 933.
[The Aspen-Amsterdam void finder comparison project](#)
60. **Neyrinck**, Mark C., 2008. MNRAS 386, 2101.
[ZOBOV: a parameter-free void-finding algorithm](#)
61. **Neyrinck**, Mark C. & Szapudi, I., 2008. MNRAS 384, 1221.
[Baryon oscillations in galaxy and matter power-spectrum covariance matrices](#)
62. **Neyrinck**, Mark C. & Szapudi, I., 2007. MNRAS 375, L51.
[Information content in the halo-model dark-matter power spectrum - II. Multiple cosmological parameters](#)
63. **Neyrinck**, Mark C., Szapudi, I., & Rimes, C. D., 2006. MNRAS 370, L66.
[Information content in the halo-model dark-matter power spectrum](#)
64. **Neyrinck**, Mark C., Hamilton, A. J. S., & Gnedin, N. Y., 2005. MNRAS 362, 337.
[A galaxy-halo model of large-scale structure](#)

65. **Neyrinck**, Mark C., Gnedin, N. Y., & Hamilton, A. J. S., 2005. MNRAS 356, 1222.
[VOBOZ: an almost-parameter-free halo-finding algorithm](#)
66. **Neyrinck**, Mark C., Hamilton, A. J. S., & Gnedin, N. Y., 2004. MNRAS 348, 1.
[Understanding the PSCz galaxy power spectrum with N-body simulations](#)
67. Gnedin, N. Y., ... **Neyrinck**, M. C., et al., 2003. ApJ 583, 525.
[Linear Gas Dynamics in the Expanding Universe](#)

Leniently Refereed Conference Proceedings/White Papers

1. Doré,... **Neyrinck** et al., 2018, [Science Impacts of the SPHEREx All-Sky Optical to Near-Infrared Spectral Survey II: Report of a Community Workshop on the Scientific Synergies Between the SPHEREx Survey and Other Astronomy Observatories](#)
2. Aragon-Calvo, **Neyrinck** & Silk, 2016, Proceedings of "The Zel'dovich Universe: Genesis and Growth of the Cosmic Web," 23-28 June 2014, Tallinn, Estonia.
[The origin of the galaxy color bimodality](#)
3. **Neyrinck**, Proceedings of "The Zel'dovich Universe: Genesis and Growth of the Cosmic Web,"
[An origami approximation to the cosmic web](#)
4. **Neyrinck**, Mark C., 2014, Proceedings for "Statistical Challenges in 21st Century Cosmology," IAU Symposium No. 306, Lisbon, May 2014.
[Transformationally decoupling clustering and tracer bias](#)
5. **Neyrinck**, Mark C.; Falck, Bridget L.; Szalay, Alex S., 2015, proceedings of the 13th Marcel Grossmann Meeting, [ORIGAMI: Delineating Cosmic Structures with Phase-Space Folds](#)
6. **Neyrinck**, Mark C., & Shandarin, S.F., 2015, proceedings of "The World a Jigsaw: Tessellations in the Sciences."
[Tessellating the cosmological dark-matter sheet: origami creases in the universe and how to find them](#)
7. **Neyrinck**, Mark C., 2011. "Statistical Challenges of Modern Astronomy V" conf. proc.
[Gaussianization: Enhancing the Statistical Power of the Power Spectrum](#)
8. **Neyrinck**, Mark C., Hamilton, Andrew J. S., & Gnedin, Nickolay Y., 2003. ASSL 281, 203.
[The PSCz Galaxy Power Spectrum Compared to N-Body Simulations](#)

Software-Development Accomplishments

Developed [CosmicEmuLog](#), a Python emulator of the cosmological log-density power spectrum
 Developed [CosmoPy](#), a package of Python code for cosmology
 Developed the publicly available cosmological halo-finders [VOBOZ](#) and [ORIGAMI](#), and the void-finder [ZOBOV](#)
 Expertise with N -body simulations, parallelization and running highly parallel applications
 Highly proficient in Python, C, FORTRAN, IDL, Java, Mathematica, and HTML
 Experienced in Unity
 Have also used C++, Perl, Lisp, and Inform

Non-Astronomical Interests

Music composition, piano, creative writing, mathematics, origami

Professional References

1. **Prof. Alexander Szalay**, Alumni Professor of Physics and Astronomy, Johns Hopkins University, 3400 N. Charles St., Baltimore, MD 21218, szalay@jhu.edu, (410) 516-7217
2. **Prof. István Szapudi**, Institute for Astronomy, University of Hawaii, 2680 Woodlawn Drive, Honolulu, HI 96822, szapudi@ifa.hawaii.edu, (808) 956-6196
3. **Prof. Joe Silk**, Department of Physics and Astronomy, Johns Hopkins University, 3400 N. Charles St., Baltimore, MD 21218, jsilk@jhu.edu, (410) 516-2881
4. **Prof. Shaun Cole**, Institute for Computational Cosmology, Department of Physics, University of Durham, shaun.cole@durham.ac.uk, +44-191-334-3593

5. **Prof. Sergei Shandarin**, Department of Physics and Astronomy, 6070C Malott Hall, 1251 Wescoe Hall Dr., Lawrence, KS 66045, sergei@ku.edu, (785) 864-5274
6. **Prof. Andrew J. S. Hamilton**, JILA and Dept of Astrophysical and Planetary Sciences, Univ of Colorado; Campus Box 440, Boulder, CO 80309, Andrew.Hamilton@colorado.edu, (303) 492-7833

CV last updated Sep 2020