Erwin T. Lau

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Education

- Ph.D., Astronomy & Astrophysics, University of Chicago, Chicago, IL, USA, 08/2010
- M.S., Astronomy & Astrophysics, University of Chicago, Chicago, IL, USA, 03/2006
- B.S., Astronomy and General Physics, University of Michigan, Ann Arbor, MI, USA, 05/2004
- B.S.E., Engineering Physics, University of Michigan, Ann Arbor, MI, USA, 05/2004

Professional Research Experience

- Center for Astrophysics | Harvard & Smithsonian
  Visiting Scientist, 01/2021–present
  Advisor: Akos Bogdán
- University of Miami, Department of Physics
  Postdoctoral Associate, 01/2018–present
  Advisor: Nico Cappelluti
- Yale University, Department of Physics, Yale Center for Astronomy & Astrophysics
  Associate Research Scientist, 09/2015–10/2017
  Postdoctoral Associate, 09/2011–08/2015
  Advisor: Daisuke Nagai
- Shanghai Astronomical Observatory, Key Laboratory for Research in Galaxies and Cosmology
  Postdoctoral Fellow, 09/2010–08/2011
  Advisor: Xiaohu Yang
- University of Chicago, Department of Astronomy & Astrophysics
  Graduate Research Assistant, 09/2005–08/2010
  Advisor: Andrey V. Kravtsov
- University of Michigan, Department of Physics
  Undergraduate Research Assistant, 09/2003–04/2004
  Advisor: Tim A. McKay

References

Dr. Ákos Bogdán	Smithsonian Astrophysical Observatory	abogdan@cfa.harvard.edu
Prof. Nico Cappelluti	University of Miami	ncappelluti@miami.edu
Prof. Daisuke Nagai	Yale University	daisuke.nagai@yale.edu
Prof. Andrey V. Kravtsov	University of Chicago	kravtsov@uchicago.edu

Research Interests

Computational, theoretical, and statistical modeling of galaxy clusters, groups and massive galaxies, and on their observational signatures in X-ray and microwave. Galaxy clusters and groups as cosmological probes. Physical processes in the intracluster medium. Diffuse emissions from the Intergalactic Medium and the Circumgalactic Medium. Astronomical software development.

Awards

- *Chandra* Archival Proposal, Cycle 25, "Constraining S_8 with X-ray Angular Power Spectrum of Galaxy Clusters", USD 81k
- XSEDE Computing Research Allocation TG-AST190003, "Simulating Cosmic Weather in Galaxy Clusters" , 45k node hours

Selected Invited Talks

2024/11	Ohio State University, Columbus, OH, CCAPP Seminar
2023/8	CMB-S4 Collaboration Meeting, Plenary Session
2022/10	University of Minnesota, Minneapolis, MN, Cosmology Seminar
2022/1	Center for Astrophysics, Cambridge, MA, High Energy Astrophysics Seminar
2021/10	Boise State University, Boise, Idaho, Computing Colloquium
2019/6	INAF-OAS, Bologna, Italy, Cluster Talk
2017/9	Yale University, CT, USA, Astronomy Colloquium
2017/2	Rochester Institute of Technology, Rochester, NY, USA, Astrophysics Colloquium
2017/1	Kavli Institute for the Physics and Mathematics of the Universe, Kashiwa, Japan, Astrophysics Seminar
2017/1	Academia Sinica Institute of Astronomy and Astrophysics, Taipei, Taiwan, Special Seminar
2016/1	Shanghai Astronomical Observatory, Shanghai, China, Special Seminar
2016/1	Kavli Institute for Astronomy and Astrophysics, Peking University, Beijing, Lunch Seminar
2015/9	Kavli Institute for the Physics and Mathematics of the Universe, Kashiwa, Japan, Astrophysics Lunch Talk
2015/3	University of Hong Kong, Hong Kong, Physics Seminar
2014/3	University of Michigan, Ann Arbor, MI, USA, Cluster Seminar
2013/10	Brown University, Providence, RI, USA, Astrophysics Seminar
2012/8	Shanghai Astronomical Observatory, Shanghai, China, Cosmology Seminar
2012/4	Yale University, New Haven, CT, USA, Cosmology Seminar
2010/3	University of Colorado, Boulder, CO, USA, Cluster Seminar

Conference and Workshop Presentations

2025/7	"Cosmic Ecosystems", Perimeter Institute for Theoretical Physics, Waterloo, Ontario, Canada
2025/7	"Tracing Cosmic Evolution with Galaxy Clusters V", Sexten Center for Astrophysics, Sesto, Italy
2025/6	"MM Universe 2025", University of Chicago, Chicago, Illinois, USA
2025/5	"Expanding the boundaries of dark matter halo", Shanghai Jiaotong University, Shanghai, China
2024/12	"Cosmology and Galaxy Astrophysics with Simulations & Machine Learning", Flatiron Institute, NY, USA
2024/9	"First eROSITA International Conference", MPE, Garching, Germany
2024/8	"Multiphase Madness CGM Workshop", Center for Astrophysics, Cambridge, MA
2024/7	"EAS Meeting 2024", Padova, Italy
2023/7	"CMB-S4 Summer Collaboration Meeting 2023", SLAC, Menlo Park, CA
2022/12	"CAMELS Workshop", Flatiron Institute, NY, USA
2022/6	"AGN Feeding and Feedback II", Sexten Center for Astrophysics, Sesto, Italy
2022/4	Galaxy Cluster Symposium, STSci, Baltimore, MD, USA
2019/6	XMM Workshop on Extended X-ray Sources, ESAC, Madrid, Spain
2019/1	223th AAS meeting, Seattle, WA, USA
2018/12	"Miami 2018: Topical Physics Conference", Fort Lauderdale, FL, USA
2018/10	"Accretion Histories of AGN Workshop", Miami, FL, USA
2018/7	"Alpine Cosmology Workshop 2018", Alagna Valsesia, Italy
2018/6	"AGN Feeding and Feedback", Sexten Center for Astrophysics, Sesto, Italy
2017/8	"From Chandra to Lynx: Taking the Sharpest X-ray Vision Fainter and Farther", Cambridge, MA, USA
2016/12	"Galaxy clusters: Physics Laboratories and Cosmological Probes", Cambridge, UK
2015/6	"ICM Physics and Modelling", Max Planck Institute for Astrophysics, Garching, Germany
2015/3	"Astroparticle View of Galaxy Clusters", Hiroshima University, Hiroshima, Japan
2015/3	"SnowCluster 2015", Snowmass, UT, USA
2014/6	"Cluster Paris 2014", Paris, France
2013/3	"SnowCluster 2013", Snowmass, UT, USA
2012/11	Galaxy Cluster Workshop, Ringberg, Germany
2012/8	28th IAU General Assembly, Beijing, China
2012/6	220th AAS Meeting, Anchorage, AK, USA
2012/3	"Turbulence in Cosmic Structure Formation", ASU, Tempe, AZ, USA
2011/9	"Cosmology with X-ray and SZE Observations of Galaxy Clusters", Huntsville, AL, USA
2011/3	"Astrophysics and Cosmology with Galaxy Clusters", KITP, Santa Barbara, CA, USA
2010/7	"From Massive Galaxy Formation to Dark Energy", IPMU, Kashiwa, Chiba, Japan
2010/6	10th "Great Lakes Cosmology Workshop", Chicago, IL, USA
2010/1	215th AAS meeting, Washington, DC, USA
2007/2	"Clusters of Galaxies as Cosmological Probes", Aspen, CO, USA

Professional Activities and Academic Services

Referee for:

- Nature Communications
- The Astrophysical Journal
- The Monthly Notices of the Royal Astronomical Society
- Astronomy & Astrophysics
- Research in Astronomy & Astrophysics

- RAS Techniques and Instruments

Review Panelist, National Science Foundation - Astronomy and Astrophysics Research Grants, 2023
Peer Reviewer, *Chandra* Cycle 20 Peer Review, 2018
Sprint Coordinator, The LSST Dark Energy Science Collaboration, 2024/7 -present
Organizer, Cosmology Seminar at Yale University, 2012–2014

Scientific Collaborations

Member, The LSST Dark Energy Science Collaboration, 2017-current
Provisional Member, The CMB-S4 Collaboration, 2022-current
Member, the OLIMPO Team, 2023-current

Professional Societies

Member, American Astronomical Society
Member, International Astronomical Union

Mentoring and Teaching

Co-supervised undergraduate and graduate students with Prof. Daisuke Nagai at Yale University, Prof. Nico Cappelluti at the University of Miami, and Dr. Ákos Bogdán at the Center for Astrophysics.

Graduate Students

Naomi Gluck, Yale Physics (2022-current)

Undergraduate Students

Mehika Patel: Yale Undergrad (2022)
Senior Project: "Baryon Pasting on the Cloud'

Amanda Butler Contreras: Yale Undergrad (2020-2022)
Senior Project: "Astrophysical Feedback in the WHIM and the Missing Baryon Problem"

Luis Fernando Machado:
Post-Baccalaureate (2020-2021) Project: "Modeling Gas Shapes in Galaxy Clusters and Groups"
Yale Undergrad (2016 - 2017) Project: "Modeling HST-COS Observations of Galaxy Cluster Outskirts"

Guanhua Chen: UMiami Undergrad (2019)
Project: "Semi-Analytic Modeling of X-ray and SZ Cross Power Spectra of Galaxy Clusters and Groups

Emil Öhman: Yale Undergrad (2015 - 2017)
Junior Project: "High resolution modeling of gas properties in galaxy cluster outskirts"
Senior Project: "Nature of gas streams and cold fronts in cosmological simulations of galaxy clusters"

Mari Kawakatsu: Yale Undergrad (2016 - 2017)
Senior Project: "Improving Galaxy Cluster Mass Measurements with Machine Learning Techniques"

Julia Menzel: Yale Undergrad (2015 - 2016)
Senior Project: "Streaming gas motions in galaxy clusters"

Joshua Burt, Yale Grad Student, Physics (2014-2015)
Summer Project: "Finding Gas Filaments in the Outskirts of Galaxy Clusters"

Christopher Cappiello: Yale Undergrad (2013 - 2015)
Awarded DeForest Pioneer Prize in Physics, Yale University, 2015
Senior Project: "Shapes of Galaxy Clusters"

Maya Fishbach: Yale Undergrad (2013 - 2015)
Awarded Howard L. Schultz Prize in Physics, Yale University, 2015
Senior Project: "Evolution of the filamentary gas flows in simulated galaxy clusters"
Junior Project: "Cluster Merger Simulations with Self-Interacting Dark Matter"

Hendrik Kits van Heyningen: Yale Undergrad (2013-2014)
Awarded DeForest Pioneer Prize in Physics, Yale University, 2014
Senior Project: "Modified Gravity & Dark Energy in Spherical Collapse Model"

Benjamin Elder, Yale Grad Student, Physics (2012-2013)
First Year Project: "Cosmological Simulations with Self-Interacting Dark Matter"

Dan Steinbrook: Yale Undergrad (Summer 2012)
Summer Project: "Effects of $f(R)$ gravity on the Shapes of Galaxy Clusters"

Elizabeth Peng: Yale Undergrad (2011-2012)
Senior Project: "Mock ASTRO-H Simulations of Galaxy Clusters"

Teaching Experience

Graduate Teaching Assistant, University of Chicago, 2004–2005, 2007

Publications by Erwin T. Lau

Journal Publications

1. Saxena, H., Sayers, J., Gavidia, A., Melin, J.-B., **Lau, E. T.**, Kim, J., Chappuis, L., Eckert, D., Ettori, S., Gaspari, M., Gastaldello, F., Kay, S., Lovisari, L., Oppizzi, F., Petris, M. D., Pratt, G. W., Pointecouteau, E., Rasia, E., Rossetti, M., Sereno, M., *CHEX-MATE: The Impact of Triaxiality and Orientation on Planck SZ Cluster Selection and Weak Lensing Mass Measurements*, 2025, A&A, submitted

2. Cerini, G., Bellomi, E., Cappelluti, N., Khizroev, S., **Lau, E. T.**, Natarajan, P., ZuHone, J., *Revisiting galaxy cluster scaling relations through dark matter-gas coherence: scatter dependence on dynamical state*, 2025, ApJ, submitted

3. **Lau, E. T.**, Nagai, D., Bogdán, Á.. Medlock, I., Oppenheimer, B. D., Battaglia, N., Genel, S., Angles-Alcazar, D., Ni, Y., Villaescusa-Navarro, F., *X-raying CAMELS: Constraining Baryonic Feedback in the Circum-Galactic Medium with the CAMELS simulations and eRASS X-ray Observations*, 2025, ApJ, 984,190 arXiv:2412.04559

4. **Lau, E. T.**, Bogdán, Á., Nagai, D., Cappelluti, N., Shirasaki, M., *Cosmology and Astrophysics with the Diffuse eRASS1 X-ray Angular Power Spectrum*, 2025, ApJ, 983, 8 arXiv:2410.22397

5. Hernández-Martínez, E. , Genel, S., Villaescusa-Navarro, F., Steinwandel, U. P., Lee, M. E., **Lau, E T.**, Spergel, D. N., *Cosmological and Astrophysical Parameter Inference from Stacked Galaxy Cluster Profiles Using CAMELS-zoomGZ*, 2025, ApJ, 981,170, arXiv:2410.10942

6. **Lau, E. T.**, Nagai, D., Farahi, A., Ishiyama, T., Miyatake, H., Osato, K., Shirasaki, M., *Baryon Pasting the Uchuu Lightcone Simulation*, 2025, ApJ , 980, 122, arXiv:2411.00108

7. Shirasaki, M., Sifón, C., Miyatake, H., **Lau, E.**, Zhang, Z., Bahcall, N., Devlin, M., Dunkley, J., Farahi, A., Hilton, M., Lin, Y.-T., Nagai, D., Staggs, S. T., Sunayama, T., Spergel, D., Wollack, E. J., *Masses of Sunyaev-Zel'dovich Galaxy Clusters Detected by The Atacama Cosmology Telescope: Stacked Lensing Measurements with Subaru HSC Year 3 data*, 2024, Physical Review D, 110, 103006, arXiv:2407.08201

8. Singh, P., **Lau, E. T.** , Faerman, Y., Stern, J., Nagai, D., *Comparison of models for the warm-hot circumgalactic medium around Milky Way-like galaxies*, 2024, MNRAS, 532, 3222, arXiv:2407.06555

9. Lee, M. E., Genel, S., Wandelt, B. D., Zhang, B., Delgado, A. M., Pandey, S., **Lau, E. T.** , Carr, C., Cook, H., Nagai, D., Angles-Alcazar, D., Villaescusa-Navarro, F., Bryan, G. L. , *Zooming by in the CARPoolGP Lane: New CAMELS-TNG Simulations of Zoomed-in Massive Halos*, 2024, ApJ, 968, 11, arXiv:2403.10609

10. Zhang, Z., Farahi, A., Nagai, D., **Lau, E. T.**, Frieman, J., Ricci, M., von der Linden, A., Wu, H.-Y., and the LSST Dark Energy Science Collaboration, *Impact of Property Covariance on Cluster Weak lensing Scaling Relations*, 2024, MNRAS, 530, 3127, arXiv:2310.18266

11. Zhang, C., Zhuravleva, I., Markevitch, M., ZuHone, J., Mernier, F., Biffi, V., Bogdán, Á., Chakraborty, P., Churazov, E., Dolag, K., Ettori, S.., Forman, W. R., Jones, C., Khabibullin, I., Kilbourne, C., Kraft, R., **Lau, E. T.** , Lin, S.-C., Nagai, D., Nelson, D., Ogorzałek, A., Rasia, E., Sarkar, A., Simionescu, A., Su, Y.,Vogelsberger, M., Walker, S., *Mapping the Intracluster Medium in the Era of High-resolution X-ray Spectroscopy*, 2024, MNRAS, 530, 4234, arXiv:2310.02225

12. Bogdán, Á., Khabibullin, I., Kovács, O. E., Schellenberger, G., ZuHone, J., Burchett. J. N., Dolag. K.,, Churazov. E., Forman, W. R., Jones. C., Kilbourne, K., Kraft, R. P., **Lau, E.**, Markevitch, M., McCammon, D., Nagai, D., Nelson, D.., Ogorzałek, A., Oppenheimer, B. D., Sarkar, A., Su, Y., Truong, N., Veilleux, S., Vladutescu-Zopp. S., Zhuravleva, I., *Circumgalactic Medium on the Largest Scales: Detecting X-Ray Absorption Lines with Large-area Microcalorimeters*, 2023, ApJ, 953, 42, arXiv:2306.05449

13. Butler Contreras, A., **Lau, E. T.**, Oppenheimer, B. D., Bogdán, A., Tillman, M., Nagai, D., Kovács, O. E., Burkhart, B., *X-ray absorption lines in the warm-hot intergalactic medium: probing Chandra observations with the CAMEL simulations*, 2023, MNRAS, 519, 2251, arXiv:2211.15675

14. **Lau, E. T.**, Bogdán, Á., Chadayammuri, U., Nagai, D., Kraft, R., Cappelluti, N., *The X-ray Angular Power Spectrum of Extended Sources in the eROSITA Final Equatorial Depth Survey*, 2023, MNRAS, 518, 1496, arXiv:2204.13105

15. Moser, E., Battaglia, N., Nagai, D. **Lau, E.**, Machado Poletti Valle, L. F.,Villaescusa-Navarro, F., Amodeo, S., Anglés-Alcázar, D., Bryan, G. L., Davé, R., Hernquist, L., Vogelsberger, M., *The Circumgalactic Medium from the CAMELS Simulations: Forecasting Constraints on Feedback Processes from Future Sunyaev-Zeldovich Observations*, 2022, ApJ, 933, 133, arXiv:2201.02708

16. Villaescusa-Navarro, F., Genel, S., Angles-Alcazar, D., Thiele, L., Davé, R., Narayanan, D., Nicola, A., Li, Y., Villanueva-Domingo, P., Wandelt, B., Spergel, D. N., Somerville, R. S., Zorrilla M., José, M., Mohammad, F. G., Hassan, S., Shao, H., Wadekar, D., Eickenberg, M., Wong, K. W.-K., Contardo, G., Jo, Y., Moser, E., **Lau, E. T.**, Machado Poletti Valle, L. F., Perez, L. A., Nagai, D., Battaglia, N., Vogelsberger, M., *The CAMELS Multifield Dataset: Learning the Universe's Fundamental Parameters with Artificial Intelligence*, 2022, ApJS, 259, 61, arXiv:2109.10915

17. Stapelberg, S., Tchernin, C., Hug, D., **Lau, E. T.**, Bartelmann, M., *Triaxiality in galaxy clusters: Mass versus Potential reconstructions*, 2021 A&A, 663, A17 arXiv:2012.13413

18. Aung, H., Nagai, D., **Lau, E. T.**, *Shock and Splash: Gas and Dark Matter Halo Boundaries around ΛCDM Galaxy Clusters*, 2021, MNRAS, 508, 2071, arXiv:2012.00977

19. Machado Poletti Valle, L. F., Avestruz, C., Barnes, D. J., Farahi, A., **Lau, E. T.**, Nagai, D., *SHAPing the Gas: Understanding Gas Shapes in Dark Matter Haloes with Interpretable Machine Learning*, 2021, MNRAS, 507, 1468 arXiv:2011.12987

20. **Lau, E. T.**, Hearin, A. P., Nagai, D., Cappelluti, N., *Correlations between Triaxial Shapes and Formation History of Dark Matter Haloes*, 2021, MNRAS, 500, 1029, arXiv:2006.09420

21. Simionescu, A., Ettori, S., Werner, N., Nagai, D., Vazza, F., Akamatsu, H., Pinto, C., de Plaa, J., Wijers, N., Nelson, D., Pointecouteau, E., Pratt, G. W., Spiga, D., **Lau, E.**, Rossetti, M., Gastaldello, F., Biffi, V., Bulbul, E., den Herder, J. W., Eckert, D. Fraternali, F., Mingo, B., Pareschi, G., Pezzulli, G., Reiprich, T. H., Schaye, J., Walker, S. A., Werk, J., *Voyage through the Hidden Physics of the Cosmic Web*, 2021, Experimental Astronomy, 51, 1043, arXiv:1908.01778

22. Comparat, J., Eckert, D., Finoguenov, A., Schmidt, R., Sanders, J., Nagai, D., **Lau, E. T.**, Kaefer, F., Pacaud, F., Clerc, N., Reiprich, T. H., Bulbul, E., Ider Chitham, J., Chuang, C.-H., Ghirardini, V., Gonzalez-Perez, V., Gozaliazl, G., Kirkpatrick, C. C., Klypin, A., Merloni, A., Nandra, K., Liu, T., Prada, F., Ramos-Ceja, M. E., Salvato, M., Seppi, R., Tempel, E., Yepes, G., *Full-sky photon simulation of clusters and active galactic nuclei in the soft X-rays for eROSITA*, 2020, The Open Journal of Astrophysics, 3, 13, arXiv:2008.08404

23. Tchernin, C., **Lau, E. T.**, Stapelberg, S., Hug, D., Bartelmann, M., *Characterizing galaxy clusters by their gravitational potential: systematics of cluster potential reconstruction*, 2020, A&A, 644, A126, arXiv:2008.01107

24. Shirasaki, M., **Lau, E. T.**, Nagai, D., *Probing Cosmology and Cluster Astrophysics with Multi-Wavelength Surveys I. Correlation Statistics*, 2020, MNRAS, 491, 235, arXiv:1909.02179

25. Chen, H., Avestruz, C., Kravtsov, A V., **Lau, E. T.**, Nagai, D., *Imprints of mass accretion history on the shape of the intracluster medium and the $T_X - M$ relation*, 2019, MNRAS, 490, 2380 arXiv:1903.08662

26. Shi, X., Nagai, D., **Lau, E. T.**, *Multiscale analysis of turbulence evolution in the density-stratified intracluster medium*, 2018, MNRAS, 481, 1075 arXiv:1806.05056

27. Shirasaki, M., **Lau, E. T.**, Nagai, D., *Modelling Baryonic Effects on Galaxy Cluster Mass Profiles*, 2018, MNRAS, 477, 2804, arXiv:1711.06366

28. ZuHone, J. A., Kowalik, K., Öhman, E., **Lau, E.**, Nagai, D., *The Galaxy Cluster Merger Catalog: An Online Repository of Mock Observations from Simulated Galaxy Cluster Mergers*, 2018, ApJS, 234, 4, arXiv:1609.04121

29. Zinger, E., Dekel, A., Birnboim, Y., Nagai, D., **Lau, E.**, Kravtsov, A. V., *Cold Fronts and Shocks Formed by Gas Streams in Galaxy Clusters*, 2018, MNRAS, 476, 56, arXiv:1609.05308

30. Ota, N., Nagai, D., **Lau, E. T.**, *Constraining hydrostatic mass bias of galaxy clusters with high-resolution X-ray spectroscopy*, 2018, PASJ, 70, 51, arXiv:1507.02730

31. **Lau, E. T.**, Gaspari, M., Nagai, D., Coppi, P., *Physical Origins of Gas Motions in Galaxy Cluster Cores: Interpreting Hitomi Observations of the Perseus Cluster*, 2017, ApJ, 849, 54, arXiv:1705.06280

32. Tchernin, C., Eckert, D., Ettori, S., Pointecouteau, E.. Paltani, S., Molendi, S., Hurier, G., Gastaldello, F., **Lau, E. T.**, Nagai, D., Roncarelli, M.. Rossetti, M., *The XMM Cluster Outskirts Project (X-COP): Physical conditions to the virial radius of Abell 2142*, 2016, A&A, 595, A42, arXiv:1606.05657

33. Avestruz, C., Nagai, D., **Lau, E. T.**, *Stirred, not Clumped: Evolution of Temperature Profiles in the Outskirts of Galaxy Clusters*, 2016, ApJ, 833, 227, arXiv:1605.01723

34. Shirasaki, M., Nagai, D., **Lau, E. T.**, *Covariance in the Thermal SZ-Weak Lensing Mass Scaling Relation of Galaxy Clusters*, 2016, MNRAS, 460, 3913, arXiv:1603.08609

35. Shi, X., Komatsu, E., Nagai, D., **Lau, E. T.**, *Analytical model for non-thermal pressure in galaxy clusters - III. Removing the hydrostatic mass bias*, 2016, MNRAS, 455, 2936, arXiv:1507.04338

36. Sembolini, F. , Yepes, G., Pearce, F. R., Knebe, A., Kay, S. T., Power, C., Cui, W., Beck, A. M., Borgani, S., Dalla Vecchia, C., Davé, R., Elahi, P. J., February, S., Huang, S., Hobbs, A., Katz, N., **Lau, E.**, McCarthy, I. G., Murante, G., Nagai, D., Nelson, K., Newton, R. D. A., Perret, V., Puchwein, E., Read, J. I., Saro, A., Schaye, J., Teyssier, R.,Thacker, R. J., *nIFTy galaxy cluster simulations - I. Dark matter and non-radiative models*, 2016, MNRAS, 457, 2063, arXiv:1503.06065

37. **Lau, E. T.**, Nagai, D., Avestruz, C., Nelson, K., Vikhlinin, A., *Mass Accretion and its Effects on the Self-similarity of Gas Profiles in the Outskirts of Galaxy Clusters*, 2015, ApJ, 806, 86, arXiv:1411.5361

38. Avestruz, C., Nagai, D., **Lau, E. T.**, Nelson, K., *Non-Equilibrium Electrons in the Outskirts of Galaxy Clusters*, 2015, ApJ, 808, 176, arXiv:1410.8142

39. Rasia, E., **Lau, E. T.**, Borgani, S., Nagai, D., Dolag K., Avestruz, C., Granato, G. L., Mazzotta, P., Murante, G., Nelson, K., Ragone-Figueroa, C., *Temperature Structure of the Intra-Cluster Medium from SPH and AMR simulation*, 2014, ApJ, 791, 96, arXiv:1406.4410

40. Zhuravleva, I., Churazov, E., Schekochihin, A. A., **Lau, E. T.**, Nagai, D., Gaspari, M., Allen, S. W., Nelson, K., Parrish, I. J. *The relation between gas density and velocity power spectra in galaxy clusters: qualitative treatment and cosmological simulations* 2014, ApJL, 788, L13, arXiv:1404.5306

41. Gaspari, M., Churazov, E., Nagai, D., **Lau, E. T.**, Zhuravleva, I., *The relation between gas density and velocity power spectra in galaxy clusters: high-resolution hydrodynamic simulations and the role of conduction*, 2014, A&A, 569, A67, arXiv:1404.5302

42. Nelson, K., **Lau, E. T.**, Nagai, D., *Hydrodynamic Simulation of Non-thermal Pressure Profiles of Galaxy Clusters*, 2014, ApJ, 792, 25, arXiv:1404.4636

43. Avestruz, C., **Lau, E. T.**, Nagai, D., Vikhlinin, A., *Testing X-ray Measurements of Galaxy Cluster Outskirts with Cosmological Simulations*, 2014, ApJ, 797, 117, arXiv:1404.4634

44. Wang, L., Yang, X., Shen, S., Mo, H. J., van den Bosch., F. C., Luo, W., Wang, Y., **Lau, E. T.**, Wang, Q. D., Kang, X., Li, R., *Measuring the X-ray luminosities of SDSS DR7 clusters from RASS*, 2014, MNRAS, 439, 611, arXiv:1312.7417

45. Harvey, D., Tittley, E., Massey, R., Kitching, T. D., Taylor, A., Pike, S. R., Kay, S. .T., **Lau, E. T.**, & Nagai, D., *On the cross-section of Dark Matter using substructure infall into galaxy clusters*, 2014, MNRAS, 441, 404, arXiv:1310.1731

46. Nelson, K., **Lau, E. T.**, Nagai, D., Rudd, D. H., & Yu, L., *Weighing Galaxy Clusters with Gas. II. On the Origins of Hydrostatic Mass Bias in ΛCDM Galaxy Clusters*, 2014, ApJ, 782, 107, arXiv:1308.6589

47. Nagai, D., **Lau, E. T.**, Avestruz, C., Nelson, K., & Rudd, D. H., *Predicting Merger-Induced Gas Motions in ΛCDM Galaxy Clusters*, 2013, ApJ, 777, 137, arXiv:1307.2251

48. **Lau, E. T.**, Nagai, D., & Nelson, K., *Weighing Galaxy Clusters with Gas. I. On the Methods of Computing Hydrostatic Mass Bias*, 2013, ApJ, 777, 151, arXiv:1306.3993

49. Khedekar, S., Churazov, E., Kravtsov, A., Zhuravleva, I., **Lau, E. T.**, Nagai, D., & Sunyaev, R., *Bias from gas inhomogeneities in the pressure profiles as measured from X-ray and Sunyaev-Zeldovich observations*, 2013, MNRAS, 431, 954, arXiv:1211.3358

50. Zhuravleva, I., Churazov, E., Kravtsov, A., **Lau, E. T.**, Nagai, D., & Sunyaev, R., *Quantifying properties of ICM inhomogeneities*, 2012, MNRAS, 428, 3274, arXiv:1210.6706

51. **Lau, E. T.**, Nagai, D., Kravtsov, A. V., Vikhlinin,, A., & Zentner, A. R., *Constraining Cluster Physics with the Shape of X-Ray Clusters: Comparison of Local X-Ray Clusters Versus ΛCDM Clusters*, 2012, ApJ, 755, 116, arXiv:1201.2168

52. Eckert, D., Vazza, F., Ettori, S., Molendi, S. Nagai, D., **Lau, E. T.**, Roncarelli, M., Rossetti, M., Snowden, S. L., & Gastaldello, F., *The Gas Distribution in the Outer Regions of Galaxy Clusters*, 2012, A&A, 541, A75, arXiv:1111.0020

53. **Lau, E. T.**, *Characterizing Galaxy Clusters with Gravitational Potential*, 2011, ApJ, 736, 145, arXiv:1009.2124

54. Nagai, D., & **Lau, E. T.**, *Gas Clumping in the Outskirts of ΛCDM Clusters*, 2011, ApJL, 731 L10, arXiv:1103.0280

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2. Walker, S., Nagai, D., Simionescu, A., Markevitch, M., Akamatsu, H., Arnaud, M., Avestruz, C., Bautz, M., Biffi, V., Borgani, S., Bulbul, E., Churazov, E., Dolag, K., Eckert, D., Ettori, S., Fujita, Y., Gaspari, M., Ghirardini, V., Kraft, R., **Lau, E. T.**, Mantz, A., Matsushita, K., McDonald, M., Miller, E., Mroczkowski, T., Nulsen, P., Okabe, N., Ota, N., Pointecouteau, E., Pratt, G., Sato, K., Shi, X., Tremblay, G., Tremmel, M., Vazza, F., Zhuravleva, I., Zinger, E., ZuHone, J., *Unveiling the Galaxy Cluster - Cosmic Web Connection with X-ray observations in the Next Decade*, 2019, Astro2020: Decadal Survey on Astronomy and Astrophysics, science white papers, no. 218, Bulletin of the American Astronomical Society, Vol. 51, Issue 3, id. 218, arXiv:1903.04550