

Dr. Vicente Rodriguez-Gomez

CONTACT INFORMATION	Instituto de Radioastronomía y Astrofísica Universidad Nacional Autónoma de México Apdo. Postal 72-3, 58089 Morelia, Mexico	<i>E-mail:</i> vrodgom.astro [at] gmail.com <i>Website:</i> GitHub <i>ORCID:</i> 0000-0002-9495-0079
RESEARCH INTERESTS	Galaxy formation and evolution, cosmological simulations, hydrodynamics, galaxy mergers and interactions, galaxy morphology, data analysis	
EDUCATION	Harvard University PhD , Astronomy & Astrophysics 2016 <ul style="list-style-type: none">• Thesis advisor: Lars Hernquist• Thesis title: <i>Galaxy mergers and some consequences: the cosmological context</i>• Secondary Field in Computer Science and Engineering AM , Astronomy 2012	
	National Autonomous University of Mexico BS , Physics 2009	
EMPLOYMENT	Associate Professor 2018 – Present Instituto de Radioastronomía y Astrofísica, Universidad Nacional Autónoma de México Postdoctoral Fellow 2016 – 2018 Department of Physics & Astronomy, Johns Hopkins University Supervisor: Jennifer Lotz Postdoctoral Fellow 2016 Institute for Theory and Computation, Harvard-Smithsonian Center for Astrophysics Supervisor: Lars Hernquist	
SUMMARY OF PUBLICATIONS	Publications: 67 refereed (5 as first author) Citations: 6056 in total (1356 as first author) Bibliometrics: <i>h</i> -index of 33	
PUBLIC SOFTWARE PACKAGES	<ul style="list-style-type: none">• statmorph https://statmorph.readthedocs.io Python package for calculating morphological diagnostics of galaxy images• SubLink https://bitbucket.org/vrodgom/sublink C++ code for constructing and analyzing merger trees in cosmological simulations• galaxev_pipeline https://github.com/vrodgom/galaxev_pipeline Python and C code for generating synthetic images of simulated galaxies	
GRANTS	<ul style="list-style-type: none">• NASA Astrophysics Data Analysis Program (Co-I) 2022• NASA JWST Cycle 1 General Observer Program (Co-I) 2021• XSEDE Computing allocation (Co-I) 2019–2020• PAPIIT Grant, UNAM (PI) 2019• UC MEXUS–CONACyT Collaborative Grant (PI) 2019• NASA HST Cycle 27 Archival Research Program (Co-I) 2019• NASA HST Cycle 22 Theory Program (Co-I) 2014	
GRADUATE STUDENT MENTORSHIP	<ul style="list-style-type: none">• Alejandro Guzmán-Ortega 2020 – Present• Daniel Montenegro-Taborda 2020 – Present• Luis Enrique Pérez-Montaño 2019 – 2023	

ACADEMIC SERVICE	<p>Referee for: The Astrophysical Journal (ApJ), ApJ Letters, Monthly Notices of the Royal Astronomical Society (MNRAS), MNRAS Letters, Astronomy & Astrophysics, Astronomy & Computing, MDPI, World Scientific Publishing</p> <p>Proposal reviewer for: European Research Council, Dutch Research Council (NWO), PAPIIT-UNAM, University of Guanajuato</p>	
TEACHING	<ul style="list-style-type: none"> • Professor, Instituto de Radioastronomía y Astrofísica, UNAM <i>Preparatory Course in Electromagnetism</i> Fall 2021 • Professor, Instituto de Radioastronomía y Astrofísica, UNAM <i>Cosmology</i> Spring 2021 • Professor, Instituto de Radioastronomía y Astrofísica, UNAM <i>Preparatory Course in Electromagnetism</i> Fall 2020 • Professor, Instituto de Radioastronomía y Astrofísica, UNAM <i>Cosmology</i> Fall 2019 • Workshop Instructor, Clubes de Ciencia, Mexico <i>High-Performance Computing: from Climate Models to Cosmology</i> Summer 2019 • Professor, Escuela Nacional de Estudios Superiores - Morelia <i>Distributed Computing</i> Spring 2019 • Workshop Instructor, Clubes de Ciencia, Mexico <i>Accelerating Science Using Multiple Processors</i> Summer 2015 • Workshop Instructor, Clubes de Ciencia, Mexico <i>Simulating Structure Formation in the Universe</i> Summer 2014 • Teaching Fellow, Harvard University <i>Computing Foundations for Computational Science</i> Fall 2013 • Teaching Fellow, Harvard University <i>Introduction to Quantum Mechanics</i> Fall 2012 • Trainer, Physics Olympiad 2009 – 2010 Instructor of the Mexican students who participated in the 40th and 41st International Physics Olympiads 	
OUTREACH	<ul style="list-style-type: none"> • Popular Media, The Atlantic <i>Look at What Happens When Two Galaxies Collide</i> 2022 • Outreach Talk, Tecnológico de Costa Rica (remote) <i>The Unexpected Effect of Black Holes on Neighboring Galaxies</i> 2021 • Popular Media, El Sol de Zamora <i>Agujeros negros podrían regular creación de galaxias</i> 2021 • Outreach Talk, Tecnológico de Costa Rica (remote) <i>A Decade of Cosmological Simulations</i> 2021 • Outreach Talk, La Jacaranda Cultural, Patzcuaro <i>A Decade of Cosmological Simulations</i> 2020 • Interview, Sistema Michoacano de Radio y TV <i>Featured in the weekly radio program Clasificaci3nc... pero con C de Ciencia</i> 2019 • Interview, UNAM Campus Morelia <i>Featured in the 77th issue of the BUM bimonthly bulletin</i> 2019 	
SELECTED SCIENTIFIC TALKS	<ul style="list-style-type: none"> • IAU Symposium 377, Kuala Lumpur, Malaysia 2023 • GECo Seminar, Laboratoire d'Astrophysique de Marseille, France (remote) 2022 • Astroclub, Observatorio Astronómico de Córdoba, Argentina (remote) 2022 • Astroseminar, Macquarie University, Sydney, Australia (remote) 2021 • Clash of the Titans Workshop, Lorentz Center, Leiden, Netherlands (remote) 2021 • Galaxy Crawl, University of Arizona, Tucson, AZ (remote) 2020 • Seminar, Mesoamerican Centre for Theoretical Physics, Tuxtla, Mexico 2020 • Astronomy Colloquium, IRyA-UNAM, Morelia, Mexico 2020 	

• II Mexican Extragalactic Meeting, Morelia, Mexico	2019
• Galaxy Angular Momentum Alignment, Shanghai, China	2019
• LXII Meeting of the Mexican Physical Society, Villahermosa, Mexico	2019
• Santa Cruz Galaxy Workshop, University of California, Santa Cruz, CA	2019
• Construyendo el futuro - Encuentros de ciencia, Xochitepec, Mexico	2018
• IllustrisTNG Science Workshop, Garching, Germany	2018
• Santa Cruz Galaxy Workshop, University of California, Santa Cruz, CA	2018
• Galaxy Interactions and Mergers Across Cosmic Time, Sexten, Italy	2018
• The Growth of Galaxies in the Early Universe - IV, Sexten, Italy	2018
• Astronomy Colloquium, IRyA-UNAM, Morelia, Mexico	2018
• Galaxy Evolution in Groups and Clusters, Ringberg Castle, Germany	2017
• Astronomy Seminar, CCA, Flatiron Institute, New York, NY	2017
• ITC Luncheon, Harvard University, Cambridge, MA	2017
• Santa Cruz Galaxy Workshop, University of California, Santa Cruz, CA	2017
• HotSci Talk Series, Space Telescope Science Institute, Baltimore, MD	2017
• Galaxies Journal Club, Space Telescope Science Institute, Baltimore, MD	2016
• Astronomy Lunch Seminar, Tufts University, Medford, MA	2016
• The Many Pathways to Galaxy Growth, Prato, Italy	2015
• Astronomy Seminar, University of California, Riverside, CA	2015
• ITC Luncheon, Harvard University, Cambridge, MA	2015
• Astronomy Colloquium, IRyA-UNAM, Morelia, Mexico	2015
• AREPOfest-2 workshop, Cambridge, MA	2014
• Astronomy Colloquium, Columbia University, New York, NY	2014
• AREPOfest workshop, Heidelberg, Germany	2013
• Sussing Merger Trees workshop, Midhurst, UK	2013

REFEREED
PUBLICATIONS
AS FIRST AUTHOR

Galactic angular momentum in the IllustrisTNG simulation - I. Connection to morphology, halo spin, and black hole mass

Rodriguez-Gomez, V., Genel, S., Fall, S. M., Pillepich, A., Huertas-Company, M., Nelson, D., Pérez-Montaño, L. E., Marinacci, F., Pakmor, R., Springel, V., Vogelsberger, M., and Hernquist, L., 2022, Monthly Notices of the Royal Astronomical Society, 512, 5978

The optical morphologies of galaxies in the IllustrisTNG simulation: a comparison to Pan-STARRS observations

Rodriguez-Gomez, V., Snyder, G. F., Lotz, J. M., Nelson, D., Pillepich, A., Springel, V., Genel, S., Weinberger, R., Tacchella, S., Pakmor, R., Torrey, P., Marinacci, F., Vogelsberger, M., Hernquist, L., and Thilker, D. A., 2019, Monthly Notices of the Royal Astronomical Society, 483, 4140

The role of mergers and halo spin in shaping galaxy morphology

Rodriguez-Gomez, V., Sales, L. V., Genel, S., Pillepich, A., Zjupa, J., Nelson, D., Griffen, B., Torrey, P., Snyder, G. F., Vogelsberger, M., Springel, V., Ma, C.-P., and Hernquist, L., 2017, Monthly Notices of the Royal Astronomical Society, 467, 3083

The stellar mass assembly of galaxies in the Illustris simulation: growth by mergers and the spatial distribution of accreted stars

Rodriguez-Gomez, V., Pillepich, A., Sales, L. V., Genel, S., Vogelsberger, M., Zhu, Q., Wellons, S., Nelson, D., Torrey, P., Springel, V., Ma, C.-P., and Hernquist, L., 2016, Monthly Notices of the Royal Astronomical Society, 458, 2371

The merger rate of galaxies in the Illustris simulation: a comparison with observations and semi-empirical models

Rodriguez-Gomez, V., Genel, S., Vogelsberger, M., Sijacki, D., Pillepich, A., Sales, L. V., Torrey, P., Snyder, G., Nelson, D., Springel, V., Ma, C.-P., and Hernquist, L., 2015, Monthly Notices of the Royal Astronomical Society, 449, 49

REFEREED
PUBLICATIONS
AS CO-AUTHOR

Negligible Effects of Baryons on the Angular Momentum Scaling Relations of Galactic Dark Matter Halos

Fall, S. M. and **Rodriguez-Gomez, V.**, 2023, *The Astrophysical Journal*, 949, L14

The growth of brightest cluster galaxies in the TNG300 simulation: dissecting the contributions from mergers and in situ star formation

Montenegro-Taborda, D., **Rodriguez-Gomez, V.**, Pillepich, A., Avila-Reese, V., Sales, L. V., Rodríguez-Puebla, A. and Hernquist, L., 2023, *Monthly Notices of the Royal Astronomical Society*, 521, 800

The contribution of in situ and ex situ star formation in early-type galaxies: MaNGA versus IllustrisTNG

Cannarozzo, C., Leauthaud, A., Oyarzún, G. A., Nipoti, C., Diemer, B., Huang, S., **Rodriguez-Gomez, V.**, Sonnenfeld, A. and Bundy, K., 2023, *Monthly Notices of the Royal Astronomical Society*, 520, 5651

Morphological signatures of mergers in the TNG50 simulation and the Kilo-Degree Survey: the merger fraction from dwarfs to Milky Way-like galaxies

Guzmán-Ortega, A., **Rodriguez-Gomez, V.**, Snyder, G. F., Chamberlain, K. and Hernquist, L., 2023, *Monthly Notices of the Royal Astronomical Society*, 519, 4920

ERGO-ML I: inferring the assembly histories of IllustrisTNG galaxies from integral observable properties via invertible neural networks

Eisert, L., Pillepich, A., Nelson, D., Klessen, R. S., Huertas-Company, M. and **Rodriguez-Gomez, V.**, 2023, *Monthly Notices of the Royal Astronomical Society*, 519, 2199

Identifying Galaxy Mergers in Simulated CEERS NIRCам Images Using Random Forests

Rose, C., Kartaltepe, J. S., Snyder, G. F., **Rodriguez-Gomez, V.**, Yung, L. Y. A., Haro, P. A., Bagley, M. B., Calabró, A., Cleri, N. J., Cooper, M. C., Costantin, L., Croton, D., Dickinson, M., Finkelstein, S. L., Häußler, B., Holwerda, B. W., Koekemoer, A. M., Kurczynski, P., Lucas, R. A., Mantha, K. B., Papovich, C., Pérez-González, P. G., Pirzkal, N., Somerville, R. S., Straughn, A. N. and Tacchella, S., 2023, *The Astrophysical Journal*, 942, 54

Galaxy formation in the Santa Cruz semi-analytic model compared with IllustrisTNG - I. Galaxy scaling relations, dispersions, and residuals at $z = 0$

Gabrielpillai, A., Somerville, R. S., Genel, S., **Rodriguez-Gomez, V.**, Pandya, V., Yung, L. Y. A. and Hernquist, L., 2022, *Monthly Notices of the Royal Astronomical Society*, 517, 6091

Simulated Bars May Be Shorter but Are Not Slower Than Those Observed: TNG50 versus MaNGA

Frankel, N., Pillepich, A., Rix, H.-W., **Rodriguez-Gomez, V.**, Sanders, J., Bovy, J., Kollmeier, J., Murray, N. and Mackereth, T., 2022, *The Astrophysical Journal*, 940, 61

The merger and assembly histories of Milky Way- and M31-like galaxies with TNG50: disc survival through mergers

Sotillo-Ramos, D., Pillepich, A., Donnari, M., Nelson, D., Eisert, L., **Rodriguez-Gomez, V.**, Joshi, G., Vogelsberger, M. and Hernquist, L., 2022, *Monthly Notices of the Royal Astronomical Society*, 516, 5404

A machine learning approach to infer the accreted stellar mass fractions of central galaxies in the TNG100 simulation

Shi, R., Wang, W., Li, Z., Han, J., Shi, J., **Rodriguez-Gomez, V.**, Peng, Y. and Li, Q., 2022, *Monthly Notices of the Royal Astronomical Society*, 515, 3938

- Realistic galaxy images and improved robustness in machine learning tasks from generative modelling*
Holzschuh, B. J., O’Riordan, C. M., Vegetti, S., **Rodriguez-Gomez, V.** and Thuerey, N., 2022, Monthly Notices of the Royal Astronomical Society, 515, 652
- The formation of low surface brightness galaxies in the IllustrisTNG simulation*
Pérez-Montaño, L. E., **Rodriguez-Gomez, V.**, Cervantes Sodi, B., Zhu, Q., Pillepich, A., Vogelsberger, M. and Hernquist, L., 2022, Monthly Notices of the Royal Astronomical Society, 514, 5840
- SDSS-IV MaNGA: Cannibalism Caught in the Act-On the Frequency of Occurrence of Multiple Cores in Brightest Cluster Galaxies*
Hsu, Y.-H., Lin, Y.-T., Huang, S., Nelson, D., **Rodriguez-Gomez, V.**, Lai, H.-T., Greene, J., Leauthaud, A., Aragón-Salamanca, A., Bundy, K., Emsellem, E., Merrifield, M., More, S., Okabe, N., Rong, Y., Brownstein, J. R., Lane, R. R., Pan, K. and Schneider, D. P., 2022, The Astrophysical Journal, 933, 61
- North Ecliptic Pole merging galaxy catalogue*
Pearson, W. J., Suelves, L. E., Ho, S. C. -C, Oi, N., Brough, S., Holwerda, B. W., Hopkins, A. M., Huang, T. -C, Hwang, H. S., Kelvin, L. S., Kim, S. J., López-Sánchez, Á. R., Malek, K., Pearson, C., Poliszczuk, A., Pollo, A., **Rodriguez-Gomez, V.**, Shim, H., Toba, Y. and Wang, L., 2022, Astronomy and Astrophysics, 661, A52
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Lara-López, M. A., Galán-de Anta, P. M., Sarzi, M., Iodice, E., Davis, T. A., Zabel, N., Corsini, E. M., de Zeeuw, P. T., Fahrion, K., Falcón-Barroso, J., Gadotti, D. A., McDermid, R. M., Pinna, F., **Rodriguez-Gomez, V.**, van de Ven, G., Zhu, L., Coccato, L., Lyubenova, M. and Martín-Navarro, I., 2022, Astronomy and Astrophysics, 660, A105
- The building up of observed stellar scaling relations of massive galaxies and the connection to black hole growth in the TNG50 simulation*
Varma, S., Huertas-Company, M., Pillepich, A., Nelson, D., **Rodriguez-Gomez, V.**, Dekel, A., Faber, S. M., Iglesias-Navarro, P., Koo, D. C. and Primack, J., 2022, Monthly Notices of the Royal Astronomical Society, 509, 2654
- The abundance of satellites around Milky Way- and M31-like galaxies with the TNG50 simulation: a matter of diversity*
Engler, C., Pillepich, A., Pasquali, A., Nelson, D., **Rodriguez-Gomez, V.**, Chua, K. T. E., Grebel, E. K., Springel, V., Marinacci, F., Weinberger, R., Vogelsberger, M. and Hernquist, L., 2021, Monthly Notices of the Royal Astronomical Society, 507, 4211
- Lower-luminosity Obscured AGN Host Galaxies Are Not Predominantly in Major-merging Systems at Cosmic Noon*
Lambrides, E. L., Chiaberge, M., Heckman, T., Kirkpatrick, A., Meyer, E. T., Petric, A., Hall, K., Long, A., Watts, D. J., Gilli, R., Simons, R., Tchernyshyov, K., **Rodriguez-Gomez, V.**, Vito, F., de la Vega, A., Davis, J. R., Kocevski, D. D. and Norman, C., 2021, The Astrophysical Journal, 919, 129
- ZFIRE: The Beginning of the End for Massive Galaxies at $z \sim 2$ and Why Environment Matters*
Harshan, A., Gupta, A., Tran, K.-V., **Rodriguez-Gomez, V.**, Pillepich, A., Alcorn, L. Y., Nanayakkara, T., Kacprzak, G. G. and Glazebrook, K., 2021, The Astrophysical Journal, 919, 57

- Anisotropic satellite galaxy quenching modulated by black hole activity*
 Martín-Navarro, I., Pillepich, A., Nelson, D., **Rodriguez-Gomez, V.**, Donnari, M., Hernquist, L. and Springel, V., 2021, *Nature*, 594, 187
- The stellar halos of ETGs in the IllustrisTNG simulations. II. Accretion, merger history, and dark halo connection*
 Pulsoni, C., Gerhard, O., Arnaboldi, M., Pillepich, A., **Rodriguez-Gomez, V.**, Nelson, D., Hernquist, L. and Springel, V., 2021, *Astronomy and Astrophysics*, 647, A95
- A deep learning approach to test the small-scale galaxy morphology and its relationship with star formation activity in hydrodynamical simulations*
 Zanisi, L., Huertas-Company, M., Lanusse, F., Bottrell, C., Pillepich, A., Nelson, D., **Rodriguez-Gomez, V.**, Shankar, F., Hernquist, L., Dekel, A., Margalef-Bentabol, B., Vogelsberger, M. and Primack, J., 2021, *Monthly Notices of the Royal Astronomical Society*, 501, 4359
- MOSEL and IllustrisTNG: Massive Extended Galaxies at $z = 2$ Quench Later Than Normal-size Galaxies*
 Gupta, A., Tran, K.-V., Pillepich, A., Yuan, T., Harshan, A., **Rodriguez-Gomez, V.** and Genel, S., 2021, *The Astrophysical Journal*, 907, 95
- Quenched fractions in the IllustrisTNG simulations: the roles of AGN feedback, environment, and pre-processing*
 Donnari, M., Pillepich, A., Joshi, G. D., Nelson, D., Genel, S., Marinacci, F., **Rodriguez-Gomez, V.**, Pakmor, R., Torrey, P., Vogelsberger, M. and Hernquist, L., 2021, *Monthly Notices of the Royal Astronomical Society*, 500, 4004
- Towards a consistent framework of comparing galaxy mergers in observations and simulations*
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 Sazonova, E., Alatalo, K., Lotz, J., Rowlands, K., Snyder, G. F., Boone, K., Brodwin, M., Hayden, B., Lanz, L., Perlmutter, S. and **Rodriguez-Gomez, V.**, 2020, *The Astrophysical Journal*, 899, 85
- The fate of disc galaxies in IllustrisTNG clusters*
 Joshi, G. D., Pillepich, A., Nelson, D., Marinacci, F., Springel, V., **Rodriguez-Gomez, V.**, Vogelsberger, M. and Hernquist, L., 2020, *Monthly Notices of the Royal Astronomical Society*, 496, 2673
- The bivariate gas-stellar mass distributions and the mass functions of early- and late-type galaxies at $z \sim 0$*
 Rodríguez-Puebla, A., Calette, A. R., Avila-Reese, V., **Rodriguez-Gomez, V.** and Huertas-Company, M., 2020, *Publications of the Astronomical Society of Australia*, 37, e024
- Correlations between Black Holes and Host Galaxies in the Illustris and IllustrisTNG Simulations*
 Li, Y., Habouzit, M., Genel, S., Somerville, R., Terrazas, B. A., Bell, E. F., Pillepich, A., Nelson, D., Weinberger, R., **Rodriguez-Gomez, V.**, Ma, C.-P., Pakmor, R., Hernquist, L. and Vogelsberger, M., 2020, *The Astrophysical Journal*, 895, 102
- MOSEL Survey: Tracking the Growth of Massive Galaxies at $2 < z < 4$ Using Kinematics and the IllustrisTNG Simulation*
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- Kacprzak, G. G., Nanayakkara, T., Labbé, I., Papovich, C. and Cowley, M., 2020, *The Astrophysical Journal*, 893, 23
- Galaxy interactions in IllustrisTNG-100, I: The power and limitations of visual identification*
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- The Hubble Sequence at $z \sim 0$ in the IllustrisTNG simulation with deep learning*
Huertas-Company, M., **Rodríguez-Gomez, V.**, Nelson, D., Pillepich, A., Bottrell, C., Bernardi, M., Domínguez-Sánchez, H., Genel, S., Pakmor, R., Snyder, G. F. and Vogelsberger, M., 2019, *Monthly Notices of the Royal Astronomical Society*, 489, 1859
- A study of stellar orbit fractions: simulated IllustrisTNG galaxies compared to CALIFA observations*
Xu, D., Zhu, L., Grand, R., Springel, V., Mao, S., van de Ven, G., Lu, S., Wang, Y., Pillepich, A., Genel, S., Nelson, D., **Rodríguez-Gomez, V.**, Pakmor, R., Weinberger, R., Marinacci, F., Vogelsberger, M., Torrey, P., Naiman, J. and Hernquist, L., 2019, *Monthly Notices of the Royal Astronomical Society*, 489, 842
- Morphology and star formation in IllustrisTNG: the build-up of spheroids and discs*
Tacchella, S., Diemer, B., Hernquist, L., Genel, S., Marinacci, F., Nelson, D., Pillepich, A., **Rodríguez-Gomez, V.**, Sales, L. V., Springel, V. and Vogelsberger, M., 2019, *Monthly Notices of the Royal Astronomical Society*, 487, 5416
- Atomic and molecular gas in IllustrisTNG galaxies at low redshift*
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- Automated distant galaxy merger classifications from Space Telescope images using the Illustris simulation*
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- Studying the physical properties of tidal features - I. Extracting morphological substructure in CANDELS observations and VELA simulations*
Mantha, K. B., McIntosh, D. H., Ciaschi, C. P., Evan, R., Ferguson, H. C., Fries, L. B., Guo, Y., Koekemoer, A. M., Landry, L. D., McGrath, E. J., Simons, R. C., Snyder, G. F., Thompson, S. E., Bell, E. F., Ceverino, D., Hathi, N. P., Pacifici, C., Primack, J. R., Rafelski, M. and **Rodríguez-Gomez, V.**, 2019, *Monthly Notices of the Royal Astronomical Society*, 486, 2643
- The IllustrisTNG simulations: public data release*
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- Anomalous Low-metallicity Regions in MaNGA Star-forming Galaxies: Accretion Caught in Action?*
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The Information Content of Stellar Halos: Stellar Population Gradients and Accretion Histories in Early-type Illustris Galaxies

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Sussing merger trees: stability and convergence

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