

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: 64 refereed (5 as first author) Citations: 5730 in total (1297 as first author) Bibliometrics: <i>h</i> -index of 32	
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 – Present	

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

- 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., **Rodríguez-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 **Rodríguez-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., **Rodríguez-Gomez, V.**, Aaron Yung, L. Y., 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 $z = 0$*
Gabiñipillai, A., Somerville, R. S., Genel, S., **Rodríguez-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., **Rodríguez-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., **Rodríguez-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., **Rodríguez-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., **Rodríguez-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., **Rodríguez-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., **Rodríguez-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

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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., **Rodríguez-Gomez, V.**, Shim, H., Toba, Y., and Wang, L., 2022, *Astronomy and Astrophysics*, 661, A52

The Fornax3D project: The environmental impact on gas metallicity gradients in Fornax cluster galaxies

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., **Rodríguez-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., **Rodríguez-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., **Rodríguez-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

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ZFIRE: The Beginning of the End for Massive Galaxies at $z \sim 2$ and Why Environment Matters

Harshan, A., Gupta, A., Tran, K.-V., **Rodríguez-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., **Rodríguez-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., **Rodríguez-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., **Rodríguez-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*
Wang, L., Pearson, W. J., and **Rodriguez-Gomez, V.**, 2020, *Astronomy and Astrophysics*, 644, A87
- The Morphology-Density Relationship in $1 < z < 2$ Clusters*
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*
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- MOSEL Survey: Tracking the Growth of Massive Galaxies at $2 < z < 4$ Using Kinematics and the IllustrisTNG Simulation*
Gupta, A., Tran, K.-V., Cohn, J., Alcorn, L. Y., Yuan, T., **Rodriguez-Gomez, V.**, Harshan, A., Forrest, B., Kewley, L. J., Glazebrook, K., Straatman, C. M., 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*
Blumenthal, K. A., Moreno, J., Barnes, J. E., Hernquist, L., Torrey, P., Claytor, Z., **Rodriguez-Gomez, V.**, Marinacci, F., and Vogelsberger, M., 2020, *Monthly Notices of the Royal Astronomical Society*, 492, 2075
- The Hubble Sequence at $z \sim 0$ in the IllustrisTNG simulation with deep learning*
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- A study of stellar orbit fractions: simulated IllustrisTNG galaxies compared to CALIFA observations*
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- 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., **Rodriguez-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*
Diemer, B., Stevens, A. R. H., Lagos, C. d. P., Calette, A. R., Tacchella, S., Hernquist, L., Marinacci, F., Nelson, D., Pillepich, A., **Rodriguez-Gomez, V.**, Villaescusa-Navarro, F., and Vogelsberger, M., 2019, Monthly Notices of the Royal Astronomical Society, 487, 1529
- 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*
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- 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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- Jellyfish galaxies with the IllustrisTNG simulations - I. Gas-stripping phenomena in the full cosmological context*
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- The frequency of dwarf galaxy multiples at low redshift in SDSS versus cosmological expectations*
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Subhalo demographics in the Illustris simulation: effects of baryons and halo-to-halo variation

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The diverse evolutionary paths of simulated high- z massive, compact galaxies to $z = 0$

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Modelling galactic conformity with the colour-halo age relation in the Illustris simulation

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On the assembly of dwarf galaxies in clusters and their efficient formation of globular clusters

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