Kathryn Grasha

Title

Stromlo stellar tracks: the importance of non-solar scaled abundances for massive stars

Abstract

I present the Stromlo Stellar Tracks, a set of stellar evolutionary tracks, computed by modifying the Modules for Experiments in Stellar Astrophysics (MESA) 1D stellar evolution package, to fit the Galactic Concordance abundances for hot massive Main-Sequence stars. Until now, all stellar evolution tracks are computed at solar, scaled-solar, or alpha-element enhanced abundances, and none of these models correctly represent the Galactic Concordance abundances at different metallicities. This paper is the first implementation of Galactic Concordance abundances to the stellar evolution models. The Stromlo tracks cover massive stars (10<Msun<300) with varying rotations evolved from the pre-main sequence to the end of Carbon burning. I find that the implementation of Galactic Concordance abundances is critical for the evolution of main-sequence, massive hot stars in order to estimate accurate stellar outputs (L, T, g), which, in turn, have a significant impact on determining the ionizing photon luminosity budgets. I additionally support prior findings of the importance that rotation plays on the evolution of massive stars and their ionizing budget. The evolutionary tracks for our Galactic Concordance abundance scaling provide a more physically motivated approach than simple uniform abundance scaling with metallicity for the analysis of HII regions and have considerable implications in determining nebular emission lines and metallicity. Therefore, it is important to refine the existing stellar evolutionary models for comprehensive high-redshift extragalactic studies.

Kathryn Grasha

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Education

University of Massachusetts Department of Astronomy, Amherst, Massachusetts USA
PhD in Astronomy (May 2018)
Dissertation: The Clustering of Young Stellar Clusters in Nearby Galaxies with LEGUS
Adviser: Professor Daniela Calzetti

University of Colorado Department of Astronomy and Physical Sciences, Boulder, Colorado USA
B.A. in Astrophysics
Adviser: Professor Jeremy Darling

Professional Appointments

Postdoctoral Fellow, Research School of Astronomy & Astrophysics (RSAA), Australian National University (ANU), Australia	June 2018–Present
Visiting Scientist, Australian National University, Australia	2017–2018
Visiting Scientist, Stockholm University, Sweden	2016
Graduate Research Assistant, University of Massachusetts (UMass), USA	2011–2018

Publications

45 Refereed Publications (8 first author) — As of December 21, 2020
See Publication List

Grants and Awards

Finalist, ANU Vice-Chancellor's Award for Early Career Academics	2020
ARC Centre of Excellence in All Sky Astrophysics Grant (multiple awards, $31,850 AUD)	2018–2020
International Astronomical Union (€400)	2019
International Astronomical Union (JYP 81930)	2019
Massachusetts Space Grant Consortium ($500 USD)	2017
UMass Astronomy Department Graduate Fellowship ($11,000 USD)	2017
American Astronomical Society International Travel Grant ($1300 USD)	2017
Massachusetts Space Grant Consortium ($1800 USD)	2016
NASA's Travel Fund fellowship ($1000 USD)	2013
Mary Dailey Irvine UMass Travel Grant (multiple awards, $4580 USD)	2013–2017
Massachusetts Space Grant Consortium ($5500 USD)	2012

Telescope Proposals and Observing

Optical telescopes: Anglo-Australia Telescope, Canada-France-Hawaii Telescope, Gemini Telescope

Co-I: 58.3 hours from 2 proposals. 2019

PI or **Co-PI**: 62 hours from 3 proposals 2019

Hubble Space Telescope

Co-I: 96 orbits from 3 proposals. 2013–2018

Atacama Large Millimeter/submillimeter Array

Co-I: 58.3 hours from 5 proposals. 2015–2019

Large Millimeter Telescope
Co-I: 82 hours from 2 proposals. 2015–2018

Conferences, Talks, and Seminars

10 *Invited* Conference talks/Colloquiums
28 Contributed talks

Invited Talks

Invited Colloquium: ESO's Hypatia Early Career Astronomer Series	03/2021
Invited Conference: Australia BlueMUSE Virtual Meeting	11/2020
Invited Seminar: GEARS 3D Meeting. RSAA, Australian National University. Canberra, Australia	11/2020
Invited Seminar: RSAA, Australian National University. Canberra, Australia	09/2020
Invited Conference: Metals in Galaxies Near and Far. Leiden, Netherlands	05/2019
Invited Conference: Extremely Big Eyes on the Early Universe. Tokyo, Japan	03/2019
Invited Colloquium: University of Melbourne. Melbourne, Australia	02/2018
Invited Colloquium: RSAA, Australian National University. Canberra, Australia	11/2017
Invited Seminar: Physics and Astronomy Department, Tufts University. Medford, MA	09/2016
Invited Seminar: Center for Astrophysics and Space Astronomy. Harvard, MA	03/2016

Contributed Conference Talks

ASTRO 3D Virtual Metallicity Meeting	10/2019
ASTRO 3D Virtual Town Hall	08/2020
EAS 2020 Virtual Meeting, Linking gas and star formation throughout cosmic time	07/2020
236$^{\rm th}$ American Astronomical Society Virtual Meeting	06/2020
ESO-Australia 2020: The Build Up of Galaxies. Perth, Australia	02/2020
The Art of Measuring Galaxy Properties. Milan, Italy	11/2019
OzSKA Meeting. Canberra, Australia	11/2019
KIAA Forum on Gas in Galaxies. Beijing, China	09/2019
Astronomical Society of Australia Annual Meeting. Brisbane, Australia	07/2019
EWASS 2019, Resolving the Ionized ISM. Lyon, France	06/2019
EWASS 2019, Machine Learning the Milky Way. Lyon, France	06/2019
IAU 352, Galaxy evolution with ALMA, JWST. Viana do Castelo, Portugal	06/2019
Star Formation and Ionized Gas 2019 Workshop. Quebec, Canada	05/2019
ASTRO 3D Annual Science Meeting. Sydney, Australia	05/2019
The Role of Feedback in Galaxy Formation. Potsdam, Germany	09/2018
The Formation of Globular Clusters Near and Far. Sexten, Italy	07/2018
ASTRO 3D Annual Science Meeting. Canberra, Australia	05/2018
231$^{\rm st}$ American Astronomical Society Meeting. Washington, DC	01/2018
Linking Observations and Theory of Star Formation. Sexten, Italy	07/2017
Special Session Talk: 229$^{\rm th}$ American Astronomical Society Meeting. Grapevine, Texas	01/2017
229$^{\rm th}$ American Astronomical Society Meeting. Grapevine, Texas	01/2017
How Galaxies Form Stars. Stockholm, Sweden	08/2016
Star Clusters: From Infancy to Teenagehood. Heidelberg, Germany	08/2016
The Role of Feedback in the Formation of Star Clusters. Sexten, Italy	07/2016
Research Talks for UMass Summer Intern Program. Amherst, MA	06/2016
Research Talks for UMass Summer Intern Program. Amherst, MA	06/2015
High Resolution Views of Star Formation. Santiago, Chile	03/2015

Poster Abstracts

EAS 2020 Virtual Meeting, Linking gas and star formation throughout cosmic time	07/2020
EWASS 2019, Quasars and their ISM at high-redshift. Lyon, France	06/2019
227$^{\rm th}$ American Astronomical Society Meeting. Kissimmee, FL	01/2016
Hubble 2020: Expanding on Hubble's 25th Anniversary. Baltimore, MD	04/2015
223$^{\rm rd}$ American Astronomical Society Meeting. Washington, DC	01/2015
IPAC IR Probes of Gas in Galaxies. Pasadena, CA	03/2013
221$^{\rm st}$ American Astronomical Society Meeting. Long Beach, CA	01/2013

6^{th} Annual Women in Physics Conference. Pasadena, CA 01/2011
217^{th} American Astronomical Society Meeting. Seattle, WA 01/2011
Lunar University for Astrophysics Research Robotics Workshop, Boulder, CO 10/2010

Conference Proceedings and Book Chapters

IAU 352, Galaxy evolution in the era of ALMA and JWST

Professional Service

Scientific Organizing Committees
SOC member: Astronomical Society of Australia (ASA) Early Career Workshop. Sydney, Australia 2020
SOC member: Linking Observations and Theory Across Galaxies. Sexten, Italy 2017

Organizing Events
Event organizer: ASTRO 3D West Coast Writing Retreat. Perth, Australia 2019

National Committees
Astronomical Society of Australia (ASA) Early Career Researchers Steering Committee 2019–present
Chair: ASTRO 3D New Early Career Researchers Committee 2019–present
ASTRO 3D Equity, Diversity, and Inclusiveness Committee 2019–present
ASTRO 3D Postdoctoral Committee 2019–present
ASTRO 3D Editorial Committee 2018–present

Internal Departmental Committees
RSAA Workplace Giving 2020–present
Chair: RSAA Recognition and Celebration of Diversity and Inclusion 2020–present
RSAA Social Club Treasurer 2019–present
RSAA Graduate Admission Committee 2018–present
UMass Graduate Admission Committee 2015–2017
UMass FCAD Women's Group Co-organizer 2013–2017
UMass Astronomy Faculty Hire Committee 2013

Review Panels
ANU Undergraduate Research Conference 2020
Journal Referee – Monthly Notices of the Royal Astronomical Society (MNRAS), Publications for the Astronomical Society of Australia (PASA)
Proceedings of the 6th International Conference on Women in Physics 2017
AAS Chambliss Astronomy Achievement Student Awards 2014–2018
GMRT Time Allocation Committee 2014

Media

Media Interview: International Day of Women and Girls in Science 2020 02/2020
Media Interview: The Most Anaemic Star 08/2019
The Physics at High Angular resolution in Nearby GalaxieS (PHANGS) Surveys, 2019, The Messenger, 177, 36. DOI:10.18727/0722-6691/5151

Teaching

Graduate Teaching Assistant. University of Massachusetts 2012–2017
Primary Lecturer and developer of a two-week Astronomy summer course for high school students.

Graduate Teaching Assistant. University of Massachusetts. D. Calzetti & A. Pope 2011–2014
Graded homework and administered exams for a class between 20 and 130 students. Lectured during times of Professors absence.

Supervising and Mentoring

Primary research supervisor

Undergraduate:

Sophia Ridolfo (ANU undergraduate, 2019–present), Jia Wei Teh (ANU undergraduate, 2019–present), Qianhui Chen (University of Science and Technology of China undergraduate, Winter 2020), Karla Hayward (University of Canterbury undergraduate, Summer 2020), Megan Poehler (Canterbury undergraduate, Summer 2020), Anushka Kharbanda (Canterbury undergraduate, Summer 2020), Finlay Mably (Canterbury undergraduate, Summer 2020), Aayushi Verma (Canterbury undergraduate, Summer 2020)

Graduate:

Peixin Zhu (ANU graduate, 2020–present; co-supervised)

Outreach, Community, and Mentoring

Invited Speaker: Public Outreach Talk: Canberra ACT YMCA Club	01/2021
Invited Panel Member: Women in Space at ANU: Canberra ACT	10/2020
Invited Speaker: Public Outreach Talk: Canberra ACT YMCA Club	10/2020
Invited Speaker: Feast of Facts: get to know a scientist: Canberra ACT	09/2020
Invited Speaker: Public Outreach Talk: Mount Stromlo Public Observing Night. Canberra ACT	04/2020
Invited Speaker: International International Women's Day: Meet a Scientist. Canberra ACT	03/2020
Invited Speaker: Public Outreach Talk: Mount Stromlo Public Observing Night. Canberra ACT	08/2019
Uluru Resident Astronomer. Ayers Rock NT	07/2019
Invited Speaker: Public Outreach Talk: Canberra ACT YMCA Club	01/2019
Uluru Resident Astronomer. Ayers Rock NT	08/2018
Invited Speaker: Public Outreach Talk: Mount Stromlo Public Observing Night. Canberra ACT	07/2018
Invited Speaker: Public Outreach Talk: Amherst MA Rotary Club.	02/2017
Astronomy Ally (http://www.astronomyallies.com/)	05/2016–present
Instructor: *Girls Inc./Eureka Summer Camp for Girls*. UMass Amherst MA	07/2014–07/2016
Instructor: "STEM Ambassadors Program". UMass Amherst MA	07/2014–05/2016
Invited Speaker: Amherst MA Regional Middle School.	12/2013, 03/2014, 03/2015, 03/2016
Astronomy Ambassador for the American Astronomical Society	11/2013–present
Graduate Student Senator. UMass Amherst	10/2013–05/2015
American Astronomical Society's Communicate with Washington	10/2013

Relevant Skills and Experience

Data Products

Extensive experience with ultraviolet and optical imaging and ultraviolet spectroscopy, including data reduction and analysis (HST ACS/WFC3, HST COS/STIS/FUSE, GBT, GALEX, Keck HIRES, MUSE/VLT).

Programming Languages

Python

Active Collaborations and Project Memberships

Member: Legacy Active Galactic UV Survey (LEGUS). PI: D. Calzetti

Member: Star formation, Ionized Gas, and Nebular Abundances Legacy Survey (SIGNALS). PI: L. Rousseau-Nepton

Member: Physics at High Angular resolution in Nearby GalaxieS (PHANGS). PI: E. Schinnerer

Member: ARC Centre of Excellence in All Sky Astrophysics (ASTRO 3D). PI: L. Kewley

Member: PriSM-TYPHOON long slit spectroscopy of local galaxies. PI: B. Madore

Professional Affiliations

Astronomical Society of Australia (2019 – present)

American Astronomical Society (2011 – 2019)

References

Professor Lisa Kewley Australian National University, Canberra ACT, AU
lisa.kewley@anu.edu.au

Professor Daniela Calzetti University of Massachusetts, Amherst MA, USA
calzetti@astro.umass.edu

Doctor Bruce Elmegreen IBM Research Division, Yorktown Heights NY, USA
bge@us.ibm.com

Professor Robert Kennicutt Steward Observatory University of Arizona, Tucson AZ, USA
rck@email.arizona.edu

First Author Refereed Publications

9. *Stromlo stellar tracks: non-solar scaled abundances for massive stars.*
   K. Grasha, L.J. Kewley, A. Roy, & R.S. Sutherland, ApJ, 2021 (submitted 18/10/2020).
8. *The evolution of neutral hydrogen over the past 11 Gyr via HI 21 cm absorption.*
   K. Grasha, J. Darling, A.K. Leroy, & A.D. Bolatto, MNRAS, 2020, 498, 883. DOI:10.1093/mnras/staa2521
7. *A Search for Intrinsic HI 21 cm and OH 18 cm Absorption Toward Compact Radio Sources.*
   K. Grasha, J. Darling, A. Bolatto, A.K. Leroy & J. Stocke, 2019, ApJS, 245, 3. DOI:10.3847/1538-4365/ab4906
6. *The Spatial Relation between Young Star Clusters and Molecular Clouds in M 51 with LEGUS.*
   K. Grasha, D. Calzetti, A. Adamo, R.C. Kennicutt, B.G. Elmegreen **et al.** 2019, MNRAS, 483, 4707. DOI:10.1093/mnras/sty3424
5. *Connecting Young Star Clusters to CO Molecular Gas in NGC 7793 with ALMA–LEGUS.*
   K. Grasha, D. Calzetti, L. Bittle, K.E. Johnson, J. Donovan Meyer, **et al.** 2018, MNRAS, 481, 1016. DOI:10.1093/mnras/sty2154
4. *Hierarchical Star Formation in Turbulent Media: Evidence from Young Star Clusters.*
   K. Grasha, B.G. Elmegreen, D. Calzetti, A. Adamo, A. Aloisi, **et al.** 2017, ApJ, 842, 25. DOI:10.3847/1538-4357/aa740b
3. *The Hierarchical Distribution of the Young Stellar Clusters in Six Local Star Forming Galaxies.*
   K. Grasha, D. Calzetti, A. Adamo, H. Kim, B.G. Elmegreen, **et al.** 2017, ApJ, 840, 113. DOI:10.3847/1538-4357/aa6f15
2. *The Spatial Distribution of the Young Stellar Clusters in the Star-Forming Galaxy NGC 628.*
   K. Grasha, D. Calzetti, A. Adamo, H. Kim, B.G. Elmegreen, **et al.** 2015, ApJ, 815, 93. DOI:10.1088/0004-637X/815/2/93
1. *The Nature of the Second Parameter in the IRX-β Relation for Local Galaxies.*
   K. Grasha, D. Calzetti, J.E. Andrews, J.C. Lee, & D.A. Dale. 2013, ApJ, 733, 174. DOI:10.1088/0004-637X/773/2/174

Co-Author Refereed Publications

— Submitted —

45. *On the duration of the embedded phase of star formation.*
    J. Kim, M. Chevance, J.M.D. Kruijssen, A. Schruba, K. Sandstrom, **et al.** 2021, MNRAS, submitted 1/12/2020.
44. *Looking for obscured young star clusters in NCG 1313.*
    M. Messa, D. Calzetti, A. Adamo, **K. Grasha**, K.E. Johnson, et. al. 2021, ApJ, submitted 18/11/2020.

43. *Pre-supernova feedback mechanisms drive the destruction of molecular clouds in nearby star-forming disc galaxies.*
    M. Chevance, J.M.D. Kruijssen, M.R. Krumholz, B. Groves, B.W. Keller, **et al.** 2021, MNRAS, submitted 23/10/2020.

42. *PHANGS–HST: I. Star Cluster Spectral Energy Distribution Fitting with CIGALE.*
    J.A. Turner, D.A. Dale, J.C. Lee, M. Boquien, R. Chandar, **et al.** 2021, MNRAS, submitted 10/10/2020.

41. *PHANGS-ALMA Data Processing and Pipeline.*
    A.K. Leroy, A. Hughes, D. Liu, J. Pety, E.W. Rosolowsky **et al.** 2021, ApJ, submitted 27/09/2020.

40. *Studying the ISM at 10 pc scale in NGC 7793 with MUSE: II. Constraints on the oxygen abundance and ionising radiation escape.*
    L. Della Bruna, A. Adamo, J.C. Lee, L.J. Smith, M. Krumholz, **et al.** 2021, A&A, submitted 12/09/2020.

39. *Improved Constraints on the ^{12}CO(2-1)/(1-0) Line Ratio Across Nearby Disc Galaxies.*
    J.S den Brok, D. Chatzigiannakis, F. Bigiel, J. Puschnig, A. Barnes, **et al.** 2021, MNRAS, submitted (07/05/2020).

— 2021 —

38. *Distances to PHANGS Galaxies: New Tip of the Red Giant Branch Measurements and Adopted Distances.*
    G.S. Anand, J.C. Lee, S.D. Van Dyk, A.K. Leroy, E. Rosolowsky, **et al.** 2021, MNRAS, accepted. DOI:10.1093/mnras/staa3668

— 2020 —

37. *Measuring the mixing scale of the ISM within nearby spiral galaxies.*
    K. Kreckel, I-T. Ho, G.A. Blanc, S.C.O. Glover, B. Groves, **et al.** 2020, MNRAS, 499, 193. DOI:10.1093/mnras/staa2743

36. *Molecular Gas Properties on Cloud Scales Across the Local Star-forming Galaxy Population.*
    J. Sun, A.K. Leroy, E. Schinnerer, A. Hughes, E. Rosolowsky, **et al.** 2020, ApJL, 901, L8. DOI:10.3847/2041-8213/abb3be

35. *The Age Dependence of Mid-infrared Emission around Young Star Clusters.*
    Z. Lin, D. Calzetti, X. Kong, A. Adamo, M. Cignoni, **et al.** 2020, ApJ, 896, 16. DOI:10.3847/1538-4357/ab9106

34. *Turbulent Pressure and Dynamical Equilibrium in the Molecular ISM in Nearby Star-Forming Galaxies.*
    J.-Y. Sun, A.K. Leroy, E.C. Ostriker, A. Hughes, E. Rosolowsky, **et al.** 2020, ApJ, 892, 148. DOI:10.3847/1538-4357/ab781c

33. *Studying the ISM at 10 pc scale in NGC 7793 with MUSE - I. Data description and properties of the ionized gas.*
    L. Della Bruna, A. Adamo, A. Bik, M. Fumagalli, R. Walterbos, **et al.** 2020, A&A, 635, 134. DOI:10.1051/0004-6361/201937173

32. *Candidate LBV stars in galaxy NGC 7793 found via HST photometry + MUSE spectroscopy.*
    A. Wofford, V. Ramírez, J. Lee, D. Thilker, L. Della Bruna, **et al.** 2020, MNRAS, 493, 2410. DOI:10.1093/mnras/staa290

31. *LEGUS and Hα-LEGUS Observations of Star Clusters in NGC 4449: Improved Ages and the Fraction of Light in Clusters as a Function of Age.*
    B.C. Whitmore, R. Chandar, J.C. Lee, L. Ubeda, A. Adamo, **et al.** 2020, ApJ, 889, 154. DOI:10.3847/1538-4357/ab59e5

30. *The Headlight Cloud in NGC 628: An extreme Giant Molecular Cloud in a typical galaxy disk.*
    C.N. Herrera, J. Pety, A. Hughes, S.E. Meidt, K. Kreckel, **et al.** 2020, A&A, 634, 121. DOI:10.1051/0004-6361/201936060

29. *Spatial segregation of massive clusters in dwarf galaxies.*
    B.G. Elmegreen, A. Adamo, M. Boquien, F. Bournaud, D. Calzetti, **et al.** 2020, ApJL, 888, 27. DOI:10.3847/2041-8213/ab632a

— 2019 —

28. *Mapping metallicity variations across nearby galaxy disks.*
K. Kreckel, I.-T. Ho, G. Blanc, B. Groves, F. Santoro, **et al.** 2019, ApJ, 887, 80. DOI:10.3847/1538-4357/ab5115

27. *The Gas-Star Formation Cycle in Nearby Star-Forming Galaxies I. Assessment of Multi-Scale Variations.*
E. Schinnerer, A. Hughes, A. Leroy, B. Groves, G. Blanc, **et al.** 2019, ApJ, 887, 49. DOI:10.3847/1538-4357/ab50c2

26. *Mapping electron temperature variations across a spiral arm in NGC 1672.*
I.-T. Ho, K. Kreckel, S.E. Meidt, B. Groves, G.A. Blanc, **et al.** 2019, ApJL, 885, 31. DOI:10.3847/2041-8213/ab4feb

25. *Hα Morphologies of Star Clusters: A LEGUS study of HII region evolution timescales and stochasticity in low mass clusters.*
S. Hannon, J.C. Lee, B.C. Whitmore, R. Chandar, A. Adamo, **et al.** 2019, MNRAS, 490, 4648. DOI:10.1093/mnras/stz2820

24. *An ALMA-HST Study of Millimeter Dust Emission and Star Clusters.*
J.A. Turner, D.A. Dale, A. Adamo, D. Calzetti, **K. Grasha**, **et al.** 2019, ApJ, 884, 112. DOI:10.3847/1538-4357/ab3faa

23. *SIGNALS: I. Survey Description.*
L. Rousseau-Nepton, R.P. Martin, C. Robert, L. Drissen, P. Amram, **et al.** 2019, MNRAS, 489, 5530. DOI:10.1093/mnras/stz2455

22. *MAGPHYS+photo-z: Constraining the Physical Properties of Galaxies with Unknown Redshifts.*
A.J. Battisti, E. da Cunha, **K. Grasha**, M. Salvato, E. Daddi, **et al.** 2019, ApJ, 882, 61. DOI:10.3847/1538-4357/ab345d

21. *Star Formation Histories of the LEGUS Spiral Galaxies. I. The Flocculent Spiral NGC 7793.*
E. Sacchi, M. Cignoni, A. Alosi, M. Tosi, D. Calzetti, **et al.** 2019, ApJ, 878, 1. DOI:10.3847/1538-4357/ab1de1

20. *Star Cluster Catalogs for the LEGUS Dwarf Galaxies.*
D.O. Cook, J.C. Lee, A. Adamo, H. Kim, R. Chandar, **et al.** 2019, MNRAS, 484, 4897. DOI:10.1093/mnras/stz331

— 2018 —

19. *Search For Star Cluster Age Gradient Across Spiral Arms of Three LEGUS Disk Galaxies.*
F. Shabani, E.K. Grebel, A. Pasquali, E. D'Onghia, J.S. Gallagher, **et al.** 2018, MNRAS, 478, 3590. DOI:10.1093/mnras/sty1277

18. *A Comparison of Young Star Properties with Local Galactic Environment for LEGUS/LITTLE THINGS Dwarf Irregular Galaxies.*
D.A. Hunter, A. Adamo, B.G. Elmegreen, S. Gallardo, J.C. Lee, **et al.** 2018, AJ, 156, 21. DOI:10.3847/1538-3881/aac50e

17. *The Young Star Cluster population of M51 with LEGUS: II. Testing environmental dependencies.*
M. Messa, A. Adamo, D. Calzetti, M. Reina-Campos, D. Colombo, **et al.** 2018, MNRAS, 477, 1683. DOI:10.1093/mnras/sty577

16. *Star Formation Histories of the LEGUS Dwarf Galaxies: Spatially Resolved Star Formation History of the Magellanic Irregular NGC 4449.*
E. Sacchi, M. Cignoni, A. Aloisi, M. Tosi, D. Calzetti, **et al.** 2018, ApJ, 857, 63. DOI:10.3847/1538-4357/aab844

15. *Star Formation Histories of the LEGUS Dwarf Galaxies (I): Recent History of NGC 1705, NGC 4449, and Holmberg II.*
M. Cignoni, E. Sacchi, A. Aloisi, M. Tosi, D. Calzetti, **et al.** 2018, ApJ, 856, 62. DOI:10.3847/1538-4357/aab041

14. *Extinction Maps and Dust-to-Gas Ratios in Nearby Galaxies with LEGUS.*

L. Kahre, R.A. Walterbos, H. Kim, D. Thilker, D. Calzetti, **et al.** 2018, ApJ, 855, 133. DOI:10.3847/1538-4357/aab101

13. *The Resolved Stellar Populations in the LEGUS Galaxies.*
E. Sabbi, D. Calzetti, L. Ubeda, A. Adamo, M. Cignoni, **et al.** 2018, ApJS, 235, 23. DOI:10.3847/1538-4365/aaa8e5

12. *A Study of Two Dwarf Irregular Galaxies with Asymmetrical Star Formation Distributions.*
D.A. Hunter, S. Gallardo, B.G. Elmegreen, H.-X. Zhang, A. Adamo, **et al.** 2018, ApJ, 855, 7. DOI:10.3847/1538-4357/aaa964

11. *Spatially Resolved Dust, Gas, and Star Formation in the Dwarf Magellanic Irregular NGC 4449.*
D. Calzetti, G. Wilson, B.T. Draine, H. Roussel, K.E. Johnson, **et al.** 2018, ApJ, 852, 106. DOI:10.3847/1538-4357/aaa1e2

10. *The Young Star Cluster population of M51 with LEGUS: I. A comprehensive study of cluster formation and evolution.*
M. Messa, A. Adamo, G. Östlin, D. Calzetti, **K. Grasha**, **et al.** 2018, MNRAS, 473, 996. DOI:10.1093/mnras/stx2403

— 2017 —

9. *Legacy ExtraGalactic UV Survey with The Hubble Space Telescope: Stellar Cluster Catalogs and First Insights Into Cluster Formation and Evolution in NGC 628.*
A. Adamo, J.E. Ryon, M. Messa, H. Kim, **K. Grasha**, **et al.** 2017, ApJ, 841, 131. DOI:10.3847/1538-4357/aa7132

8. *Effective Radii of Young, Massive Star Clusters in Two LEGUS Galaxies.*
J.E. Ryon, J.S. Gallagher, L.J. Smith, A. Adamo, D. Calzetti, **et al.** 2017, ApJ, 841, 92. DOI:10.3847/1538-4357/aa719e

7. *Exploring the IMF of Star Clusters: a Joint SLUG and LEGUS Effort.*
G. Ashworth, M. Fumagalli, M. Krumholz, D. Calzetti, R. Chandar, **et al.** 2017, MNRAS, 469, 2464. DOI:10.1093/mnras/stx935

6. *Hierarchical Star Formation Across the Grand Design Spiral NGC 1566.*
D.A. Gouliermis, B.G. Elmegreen, D.M. Elmegreen, D. Calzetti, M. Cignoni, **et al.** 2017, MNRAS, 468, 509. DOI:10.1093/mnras/stx445

5. *The Properties, Origin and Evolution of Stellar Clusters in Galaxy Simulations and Observations.*
C.L. Dobbs, A. Adamo, C.G. Few, D. Calzetti, D.A. Dale, **et al.** 2017, MNRAS, 464, 3580. DOI:10.1093/mnras/stw2200

— 2016 —

4. *A Comprehensive Comparative Test of Seven Widely-Used Spectral Synthesis Models Against Multi-Band Photometry of Young Massive Star Clusters.*
A. Wofford, S. Charlot, G. Bruzual, J.J Eldridge, D. Calzetti, **et al.** 2016, MNRAS, 457, 4296. DOI:10.1093/mnras/stw150

— 2015 —

3. *Star Cluster Properties in Two LEGUS Galaxies Computed with Stochastic Stellar Population Synthesis Models.*
M.R. Krumholz, A. Adamo, M. Fumagalli, A. Wofford, D. Calzetti, **et al.** 2015, ApJ, 812, 147. DOI:10.1088/0004-637X/812/2/147

2. *The Brightest Young Star Clusters in NGC 5253.*
D. Calzetti, K.E. Johnson, A. Adamo, J.S. Gallagher III, J.E. Andrews, **et al.** 2015, ApJ, 811, 75. DOI:10.1088/0004-637X/811/2/75

1. *Hierarchical Star Formation Across the Ring Galaxy NGC 6503.*
D.A. Gouliermis, D. Thilker, B.G. Elmegreen, D.M. Elmegreen, D. Calzetti, **et al.** 2015, MNRAS, 452, 3508. DOI:10.1093/mnras/stv1325