Brooke D. Simmons

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Professional Summary

- Principal interests: galaxy evolution, supermassive black holes, black hole-galaxy co-evolution, data science
- Expert in citizen science as a facility for data analysis and discovery
- Expert on parametric image decomposition, quantified visual morphology, multi-wavelength AGN analysis
- Active Collaborations: COSMOS, CANDELS, Zooniverse (Analysis Group lead), Galaxy Zoo (Deputy Project Scientist), Galaxy Zoo Bar Lengths (PI), The Planetary Response Network (PI)

Employment

December 2015 - present	Einstein Fellow, UC San Diego
June 2012 - December 2015	Henry Skynner Fellow & Postdoctoral Researcher, University of Oxford

Education

2003-2007; 2011-2012	Ph.D., Astronomy, Yale University — Advisor: C. Megan Urry *Black Hole Growth and Host Galaxy Co-Evolution Over 8 Billion Years of Cosmic Time*
2007-2011	On leave (family reasons)
2002-2003	M.S. & M.Phil., Astronomy, Yale University
2001	A.B., Astrophysical Sciences, Princeton University (honors)

Awards

January 2015	Einstein Fellowship
January 2014	Henry Skynner Junior Research Fellowship, Balliol College, Oxford
October 2012	Junior Research Fellowship, Worcester College, Oxford
June 2012	James Martin Fellowship, Oxford Martin School, Oxford

Invited Talks

Dr. Simmons is regularly invited to give astrophysics seminars and colloquia. Other invited talks include:

June 2017	"Galaxy Zoo: Past & Future", Surveying the Cosmos 2017
Aug 2015	"Making the internet work for you (in research)", Bone Research Society
Jul 2015	"Building an academic career", talk & panel, RAS National Astronomy Meeting
Feb 2015	"The Scientific Impact of Galaxy Zoo", AAAS Meeting, San Jose

Funding Awarded

Oct 2016	NASA: "Secular Black Hole Growth and Feedback in Merger-Free Galaxies", US$119,000
Dec 2015	NASA: Einstein Fellowship, US$330,000
Feb 2015	ESA: Crowdsourcing For Observations From Satellites, €175,000 (Simmons co-PI from Oxford, share: €100,000)
Sep 2011	NASA: AGN Hosts at z ~ 2, US$100,000
Sep 2005	NASA: Host Galaxies & SEDs of Luminous AGN, US$100,000

Telescope Proposals Awarded

as PI

2016-2017	*HST* Cycle 24 SNAP: ACS imaging of merger-free AGN host galaxies (121 targets)
2016-2017	Lick: Kast spectra of bulgeless quasar candidates (16 nights)
2014B	DCT: Ultra-deep imaging of bulgeless galaxies (3 nights)
2014A	INT: IDS long-slit spectra of bulgeless quasar candidates (3 nights)
2013A	Gemini-S: GMOS long-slit spectroscopy of bulgeless AGN host galaxies (7.5 hr, Band A)
2013A	WIYN: NIR & Optical imaging of bulgeless AGN host galaxies (6 nights)

Teaching

Oct. 2012 - Dec. 2015	Tutor, 4th-year Astrophysics (University of Oxford)
Jan. 2008 – Dec. 2010	Self-employed as professional tutor in math, science, reading/writing
Sept. 2001 - Jan. 2005	Teaching Fellow (Yale University). Courses: "Frontiers & Controversies in Astrophysics"; "Life in the Universe"; "Stars and Planets".
Jan. - May 2001	Teaching Assistant (Princeton University): "The Universe"

Students Supervised

Dr. Simmons has co-supervised a PhD student and supervised 3 M.Phys and 6 undergraduate students. They include R. Cochrane, A. Griffin, A. Han, T. Hutchinson, B. Kushkuley, T. Melvin, A. Schooneveld, A. Tapia.

Public Dialogue

Dr Simmons regularly gives invited public talks and contributes to blogs and social media.

Select Media Coverage

Nature, "Citizen scientists aid Ecuador earthquake relief"	*3rd May, 2016*
Nature, "Crisis Mappers Turn To Citizen Scientists"	*19th Nov, 2014*
Sky & Telescope, "Citizen Scientists Probe Early Galaxies"	*29th Sep, 2014*

Interdisciplinary Roles

Lead, Zooniverse Analysis Group

A data science collaboration including partnerships with researchers in Computer Science, Economics, Information Science, Ecology

Principal Investigator, The Planetary Response Network

Crisis response. Primary partners: Rescue Global, Oxford Machine Learning Research Group, ESA, Planet

Refereed Publications

Note: candidate name & students' names in bold

Publications as First Author

7. "Supermassive black holes in disk-dominated galaxies outgrow their bulges and co-evolve with their host galaxies"
   B. D. Simmons, R. J. Smethurst, and C. Lintott, 2017, MNRAS, 470, 1559
6. "Galaxy Zoo: Quantitative Visual Morphological Classifications for 48,000 galaxies from CANDELS"
   B. D. Simmons, C. Lintott, K. W. Willett, K. L. Masters, *et al.* (46 authors), 2017, MNRAS, 464, 4420
5. "Galaxy Zoo: CANDELS Barred Disks and Bar Fractions"
   B. D. Simmons, **T. Melvin**, C. Lintott, K. L. Masters, *et al.* (42 authors), 2014, MNRAS, 445, 3466
4. "Galaxy Zoo: Bulgeless Galaxies With Growing Black Holes"
   B. D. Simmons, *et al.* (**A. Han**: 5th of 11 authors), 2013, MNRAS, 429, 2199
3. "Moderate-luminosity Growing Black Holes from $1.25 < z < 2.7$: Varied Accretion in Disk-Dominated Hosts"
   B. D. Simmons, C. M. Urry, K. Schawinski, C. Cardamone, and E. Glikman, 2012, ApJ, 761, 75
2. "Obscured GOODS AGN and Their Host Galaxies at $z < 1.25$: The Slow Black Hole Growth Phase"
   B. D. Simmons, J. Van Duyne, C. M. Urry, E. Treister, A. M. Koekemoer, N. A. Grogin, and the GOODS Team, 2011, ApJ, 734, 121
1. "The Accuracy of Morphological Decomposition of Active Galactic Nucleus Host Galaxies"
   B. D. Simmons and C. M. Urry, 2008, ApJ, 683, 644

Publications in Zooniverse Analysis Group role

11. "Keeping it simple: an experiment in online classification design"
    A. Swanson, **B. D. Simmons**, H. Spiers, *et al.* (6 authors), submitted
10. "Integrating Human And Machine Intelligence In Galaxy Morphology Classification Tasks"
    M. Beck, *et al.* (**Simmons**: 7th of 11 authors), submitted

9. "Getting connected: An empirical investigation of the relationship between social capital and philanthropy among online volunteers", J. Cox, E. Y. Oh, **B. D. Simmons**, *et al.* (8 authors), submitted
8. "Examining patterns of volunteer behaviour across online citizen science" H. Spiers, *et al.* (**Simmons**: 4th of 7 authors), submitted
7. "Doing good online: The changing relationships between motivations, activity and retention among online volunteers", J. Cox, E. Y. Oh, **B. D. Simmons**, *et al.* (8 authors), 2017, NVSQ, in press
6. "A transient search using combined human and machine classifications" D. Wright, *et al.* (**Simmons**: 18th of 26 authors), 2017, MNRAS, 472, 1315
5. "The K2-YYY System: A Near-Resonant Chain of Four Sub-Neptune Planets Discovered by Citizen Scientists", J. L. Christiansen, *et al.* (**Simmons**: 6th of 25 authors), submitted
4. "Assessing Data Quality In Citizen Science" M. Kosmala, A. Wiggins, A. Swanson, **B. D. Simmons**, 2016, Front. Ecol. Environ., 14(10): 551–560
3. "Science Learning via Participation in Online Citizen Science" K. L. Masters, E. Y. Oh, J. Cox, *et al.* (**Simmons**: 4th of 8 authors), 2016, JCOM, 1503, A07
2. "Playing with science: Exploring how game activity motivates users' participation on an online citizen science platform", A. Greenhill, *et al.* (**Simmons**: 5th of 9 authors), 2015, Aslib Jour. Info. Mgmt, 68, 306
1. "How is success defined and measured in online citizen science? A case study of Zooniverse projects" J. Cox, E-Y. Oh, **B. D. Simmons**, *et al.* (8 authors), 2015, CISE, 17, 28

Publications as Major Contributing Author

20. "Galaxy Zoo: Secular evolution of barred galaxies from structural decomposition of multi-band images" S. Kruk, C. Lintott, S. Bamford, K. Masters, **B. D. Simmons**, *et al.* (12 authors), 2017, MNRAS, in press
19. "Normal black holes in bulge-less galaxies: the largely quiescent, merger-free growth of black holes over cosmic time", G. Martin, S. Kaviraj, M. Volonteri, **B. D. Simmons**, *et al*. (9 authors), submitted
18. "Galaxy Zoo: Finding offset discs and bars in SDSS galaxies" S. J. Kruk, C. J. Lintott, **B. D. Simmons**, S. Bamford, *et al.* (12 authors), 2017, MNRAS, 469, 3363
17. "Morphology and the Color-Mass Diagram As Clues to Galaxy Evolution at z ~ 1" M. C. Powell, C. M. Urry, C. Cardamone, **B. D. Simmons**, *et al.* (7 authors), 2017, ApJ, 835, 22
16. "Galaxy Zoo: Morphological Classifications for 120,000 Galaxies in HST Legacy Imaging" K. W. Willett, *et al.* (**Simmons**: 7th & **Han**: 17th of 21 authors), 2016, MNRAS, 464, 4176
15. "Galaxy Zoo: Evidence for rapid, recent quenching across a population of AGN host galaxies" R. J. Smethurst, C. Lintott, **B. D. Simmons**, *et al.* (11 authors), 2016, MNRAS, 463, 2986
14. "Major Mergers Host the Most Luminous Red Quasars at $z \sim 2$: A *Hubble Space Telescope* WFC3/IR Study" E. Glikman, **B. D. Simmons**, M. Mailly, K. Schawinski, C. M. Urry, M. Lacy, 2015, ApJ, 806, 218
13. "Radio Galaxy Zoo: host galaxies and radio morphologies derived from visual inspection" J. Banfield, *et al.* (**Simmons**: 7th of 36 authors), 2015, MNRAS, 453, 2326
12. "Galaxy Zoo: Evidence For Diverse Star Formation Histories Through The Green Valley" R. J. Smethurst, C. J. Lintott, **B. D. Simmons**, *et al.* (13 authors), 2015, MNRAS, 450, 435
11. "The dependence of the star formation-stellar mass relation on spiral disk morphology" K. W. Willett, K. Schawinski, **B. D. Simmons**, *et al.* (13 authors), 2015, MNRAS, 449, 820
10. "The Green Valley is a Red Herring: Galaxy Zoo reveals two evolutionary pathways towards quenching of star formation in early- and late-type galaxies" K. Schawinski, C. M. Urry, **B. D. Simmons**, *et al.* (15 authors), 2014, MNRAS, 440, 889
9. "Galaxy Zoo: Evolution of the bar fraction over the last eight billion years from HST-COSMOS" **T. Melvin**, *et al.* (**Simmons:** 5th of 14 authors), 2014, MNRAS, 438, 2882
8. "Galaxy Zoo 2: detailed morphological classifications for 304,122 galaxies from the Sloan Digital Sky Survey" K. W. Willett, *et al.* (**Simmons**: 5th of 18 authors), 2013, MNRAS, 435, 2835
7. "Major Galaxy Mergers Only Trigger the Most Luminous AGN" E. Treister, K. Schawinski, C. M. Urry, and **B. D. Simmons**, 2012, ApJL, 758, 39
6. "Heavily Obscured Quasar Host Galaxies at $z \sim 2$ are Disks, Not Major Mergers" K. Schawinski, **B. D. Simmons**, C. M. Urry, E. Treister, and E. Glikman, 2012, MNRAS Letters, 425, 61

5. "Bolometric Luminosities and Eddington Ratios of X–ray Selected AGN in the XMM-COSMOS Survey"
E. Lusso, A. Comastri, **B. D. Simmons**, *et al.* (27 authors), 2012, MNRAS, 425, 623
4. "Evidence for Three Accreting Black Holes in a Galaxy at z ~ 1.35: A Snapshot of Recently Formed Black Hole Seeds?"
K. Schawinski, C. M. Urry, E. Treister, **B. D. Simmons**, P. Natarajan, and E. Glikman, 2011, ApJL, 743, 37
3. "HST WFC3/IR Observations of AGN Hosts at z ~ 2: Supermassive Black Holes Grow in Disk Galaxies"
K. Schawinski, E. Treister, C. M. Urry, C. N. Cardamone, **B. D. Simmons**, and S. K. Yi, 2011, ApJL, 727, 31
2. "Do Moderate-Luminosity Active Galactic Nuclei Suppress Star Formation?"
K. Schawinski, **B. D. Simmons**, *et al.* (**B. Kushkuley**: 7th of 7 authors), 2009, ApJL, 692, 19
1. "Active Galactic Nucleus Host Galaxy Morphologies in COSMOS"
J. M. Gabor, C. D. Impey, K. Jahnke, **B. D. Simmons**, *et al.* (17 authors), 2009, ApJ, 691, 705

Team Publications as Contributing Author

19. "Galaxy Zoo: Morphological Classification of Galaxy Images from the *Illustris* Simulation"
H. Dickinson, *et al.* (Simmons: 10th of 16 authors), 2017, submitted
18. "Major Merging History in CANDELS. I. Evolution of the Incidence of Massive Galaxy-Galaxy Pairs from $z = 3$ to $z \sim 0$", K. Mantha, *et al.* (Simmons: 14th of 41 authors), 2017, submitted
17. "Radio Galaxy Zoo: Compact and extended radio source classification with deep learning"
V. Lukic, *et al.* (Simmons: 7th of 7 authors), 2017, submitted
16. "Evidence For Merger-Driven Growth in Luminous, High-z, Obscured AGN in the CANDELS/COSMOS Field", J. Donley, *et al.* (Simmons: 22nd of 30 authors), 2017, submitted
15. "Radio Galaxy Zoo: A Search for Hybrid Morphology Radio Galaxies"
A. D. Kapinska, *et al.* (Simmons: 17th of 17 authors), 2017, AJ, in press
14. "Galaxy Zoo and SPARCFIRE: constraints on spiral arm formation mechanisms from spiral arm number and pitch angles", R. Hart, *et al.* (Simmons: 9th of 10 authors), 2017, MNRAS, 472, 2263
13. "Galaxy Zoo: the interplay of quenching mechanisms in the group environment"
R. Smethurst, *et al.* (Simmons: 8th of 8 authors), 2017, MNRAS, 469, 3670
12. "Galaxy Zoo: major mergers are not a significant quenching pathway"
A. Weigel, *et al.* (Simmons: 12th of 13 authors), 2017, ApJ, 845, 145
11. "Galaxy Zoo: comparing the demographics of spiral arm number and a new method for correcting redshift bias", R. Hart, *et al.* (Simmons: 10th of 11 authors), 2016, MNRAS, 461, 3663
10. "Faint COSMOS AGN at z~3.3 - I. Black Hole Properties and Constraints on Early Black Hole Growth"
B. Trakhtenbrot, *et al.* (Simmons: 10th of 10 authors), 2016, ApJ, 825, 4
9. "An over-massive black hole in a typical star forming galaxy, 2 billion years after the Big Bang"
B. Trakhtenbrot, *et al.* (Simmons: 9th of 9 authors), 2015, Science, 349, 168
8. "Stellar Populations of Barred Quiescent Galaxies"
E. Cheung, *et al.* (Simmons: 12th of 13 authors), 2015, ApJ, 807, 36
7. "Galaxy Zoo: the effect of bar-driven fueling on the presence of an active galactic nucleus in disk galaxies"
M. A. Galloway, *et al.* (Simmons: 10th of 10 authors), 2015, MNRAS, 448, 3442
6. "Misalignment between cold gas and stellar components in early-type galaxies"
O. I. Wong, *et al.* (Simmons: 6th of 8 authors), 2015, MNRAS Letters, 447, 3311
5. "Galaxy Zoo: Are bars responsible for the feeding of active galactic nuclei at $0.2 < z < 1.0$?"
E. Cheung, *et al.* (Simmons: 20th of 22 authors), 2015, MNRAS, 447, 506
4. "Galaxy Zoo and ALFALFA: Atomic Gas and the Regulation of Star Formation in Barred Disc Galaxies"
K. L. Masters, *et al.* (Simmons**:** 7th of 10 authors), 2012, MNRAS, 424, 2180
3. "*Chandra* Observations of Galaxy Zoo Mergers: Frequency of Binary Active Nuclei in Massive Mergers"
S. H. Teng, *et al.* (Simmons**:** 11th of 12 authors), 2012, ApJ, 753, 165
2. "The Infrared Light Curve of SN 2011fe in M101 and the Distance to M101"
T. Matheson, *et al.* (Simmons: 39th of 46 authors), 2012, ApJ, 754, 19
1. "AGN Host Galaxies at z~0.4-1.3: Bulge-dominated and Lacking Merger-AGN Connection"
N. A. Grogin, *et al.* (Simmons: 15th of 16 authors), 2005, ApJL, 627, 97