Curriculum Vitae — Greg Salvesen

Contact Information

Department of Physics
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Research Interests

Phenomena: Accretion disks, black holes, coronae, winds, jets, state transitions, turbulence, warped disks, X-ray binaries
Processes: Dissipation, energy transfer, magnetic reconnection, non-thermal radiation mechanisms
Methods: Magnetohydrodynamic simulations, visualizations, X-ray observatories, archival data, analytic approaches

Education

University of Colorado Boulder — Aug 2009 – Aug 2016
Advisor: Prof. Mitchell C. Begelman
Thesis Title: Rethinking Black Hole Accretion Discs
Ph.D., Astrophysical & Planetary Sciences — Aug 2016
M.S., Astrophysical & Planetary Sciences — Dec 2011

University of Michigan, Ann Arbor — Sep 2005 – Aug 2009
Advisor: Prof. Jon M. Miller
B.S., Astronomy & Astrophysics (High Honors) — Aug 2009
B.S., Interdisciplinary Physics — Aug 2009
B.S.E., Aerospace Engineering (magna cum laude) — Aug 2009

Andover High School Graduate (Andover, Massachusetts) — Sep 2001 – Jun 2005

Research Experience

⋆ NSF Astronomy & Astrophysics Postdoctoral Fellow — Oct 2016 – Present
University of California, Santa Barbara
Sponsoring Scientist: Prof. Omer M. Blaes

⋆ NASA Earth and Space Science Fellow — Sep 2014 – Aug 2016
Graduate Research Assistant — Sep 2013 – Aug 2014
⋆ NSF Graduate Research Fellow — Sep 2010 – Aug 2013
JILA, University of Colorado; Boulder, Colorado
Advisor: Prof. Mitchell C. Begelman

Graduate Research Assistant — Aug 2009 – Aug 2010
CASA, University of Colorado; Boulder, Colorado
Advisor: Prof. Jack O. Burns

Undergraduate Research Assistant — May 2007 – Aug 2009
University of Michigan; Ann Arbor, Michigan
Advisor: Prof. Jon M. Miller

Research Experience for Undergraduates — Jun 2008 – Aug 2008
Harvard-Smithsonian Center for Astrophysics; Cambridge, Massachusetts
Advisors: Dr. John C. Raymond & Dr. Richard J. Edgar

Scientific and Engineering Student Internship — Jun 2007 – Aug 2007
NASA Goddard Space Flight Center; Greenbelt, Maryland
Advisor: Dr. Alexander Kutyrev

Refereed Publications

10. "Black Hole Spin Measurements are Sensitive to Accretion Disc Atmospheric Uncertainties"
Salvesen, G. & Begelman, M. C. 2018, MNRAS, submitted
9. "Six Day Footraces in the Post-Pedestrianism Era"
Salvesen, G. 2018, Journal of Quantitative Analysis in Sports, submitted
8. "Convective Quenching of Field Reversals in Accretion Disc Dynamos"
Coleman, M. S. B., Yerger, E., Blaes, O., **Salvesen, G.**, & Hirose, H. 2017, MNRAS, 467, 2625
7. "Strongly Magnetized Accretion Discs Require Poloidal Flux"
Salvesen, G., Armitage, P. J., Simon, J. B., & Begelman, M. C. 2016, MNRAS, 460, 3488-3493
6. "Accretion Disc Dynamo Activity in Local Simulations Spanning Weak-to-Strong Net Vertical Magnetic Flux Regimes"
Salvesen, G., Simon, J. B., Armitage, P. J., & Begelman, M. C. 2016, MNRAS, 457, 857-874
5. "Quantifying Energetics and Dissipation in Magnetohydrodynamic Turbulence"
Salvesen, G., Beckwith, K., Simon, J. B., O'Neill, S. M., & Begelman, M. C. 2014, MNRAS, 438, 1355-1376
4. "A Physical Model for State Transitions in Black Hole X-ray Binaries"
Nixon, C. & **Salvesen, G.** 2014, MNRAS, 437, 3994-3999
3. "Spectral Hardening as a Viable Alternative to Disc Truncation in Black Hole State Transitions"
Salvesen, G., Miller, J. M., Reis, R. C., & Begelman, M. C. 2013, MNRAS, 431, 3510-3532
2. "Shock Speed, Cosmic Ray Pressure, and Gas Temperature in the Cygnus Loop"
Salvesen, G., Raymond, J. C., & Edgar, R. J. 2009, ApJ, 702, 327-339
1. "A Deep *XMM-Newton* Observation of the Quasar 3C 287"
Salvesen, G., Miller, J. M., Cackett, E., & Siemiginowska, A. 2009, ApJ, 692, 753-757

Professional Talks

17. "The Role of Magnetic Fields in Accreting Black Holes"
Colloquium, University of Nevada, Las Vegas, 2018 Jan 26
16. "Astronomy Sound of the Month"
Astrophysics Lunch Seminar, University of California, Santa Barbara, 2018 Jan 19
15. "Black Hole Spin Measurement Uncertainty"
231st Meeting of the AAS, National Harbor, MD, 2018 Jan 12
14. "Astronomy Sound of the Month"
NSF Astronomy & Astrophysics Postdoctoral Fellows Symposium, National Harbor, MD, 2018 Jan 08
13. "Black Hole Spin in X-ray Binaries"
Astrophysics Lunch Seminar, University of California, Santa Barbara, 2017 Mar 16
12. "Strongly Magnetized Accretion Disks Around Black Holes"
229th Meeting of the AAS, Grapevine, TX, 2017 Jan 04
11. "Rethinking Black Hole Accretion Discs"
Astrophysics Seminar, University of California, Santa Barbara, 2016 Oct 26
10. "Rethinking Black Hole Accretion Discs"
Ph.D. Dissertation, University of Colorado Boulder, 2016 Jun 30
9. "Dynamo Activity in Strongly Magnetized Accretion Disks"
CASA/JILA Astrophysics Lunch Seminar, University of Colorado Boulder, 2016 Jan 29
8. "Dynamo Activity in Strongly Magnetized Accretion Disks"
227th Meeting of the AAS, Kissimmee, FL, 2016 Jan 08
7. "Dynamo Activity in Strongly Magnetized Accretion Disks"
TAC Seminar, University of California, Berkeley, 2015 Dec 07
6. "Inner Accretion Disk Regions of Black Hole X-ray Binaries"
Dissertation Talk, 225th Meeting of the AAS, Seattle, WA, 2015 Jan 06
5. "Resolving Discrepancies in Black Hole Spin Measurements"
CASA/JILA Astrophysics Lunch Seminar, University of Colorado Boulder, 2014 Dec 12

4. "Resolving Discrepancies in Black Hole Spin Measurements"
   NOAO-Tucson FLASH Talk, University of Arizona, 2014 Sep 26
3. "Spectral Hardening of the Accretion Disk in Black Hole X-ray Binaries: Implications for X-ray Transients and Black Hole Spin"
   CASA/JILA Astrophysics Lunch Seminar, University of Colorado Boulder, 2014 Feb 21
2. "A Fresh Perspective on Black Hole State Transitions"
   Institute for Astronomy, University of Hawaii, 2014 Jan 16
1. "A Fresh Perspective on Black Hole State Transitions"
   University of Pennsylvania, 2013 Dec 06

Poster Presentations

11. "Magnetized Black Hole Accretion Disks with Poloidal Flux"
    Salvesen, G., Simon, J. B., Armitage, P. J., & Begelman, M. C. 2017, HEAD 16$^{\text{th}}$ Division Meeting, Sun Valley, ID
10. "Strongly Magnetized Black Hole Accretion Disks"
    Salvesen, G., Armitage, P. J., Simon, J. B., & Begelman, M. C. 2016, *NuSTAR* Science Meeting, Pasadena, CA
9. "Strongly Magnetized Black Hole Accretion Disks"
   Salvesen, G., Armitage, P. J., Simon, J. B., & Begelman, M. C. 2016, Transient Sky Conference, Cambridge, MA
8. "A Physical Mechanism for State Transitions in Black Hole X-ray Binaries"
   Salvesen, G. & Nixon, C. 2014, 223$^{\text{rd}}$ Meeting of the AAS, National Harbor, MD
7. "Spectral Hardening in Black Hole X-ray Binaries"
   Salvesen, G., Miller, J. M., Reis, R. C., & Begelman, M. C. 2013, JSI Workshop, Annapolis, MD
6. "Black Hole Accretion: Discs, Jets, Coronae, & State Transitions"
   Salvesen, G., Begelman, M. C., Simon, J. B., & Nixon, C. 2013, JILA Poster Fest
5. "Properties and Distribution of Current Sheets in Accretion Disk Coronae"
   Salvesen, G., Begelman, M. C., Simon, J. B., & Beckwith, K. 2013, HEAD 13$^{\text{th}}$ Divisional Meeting, Monterey, CA
4. "Turbulence, Energy Transfer, and Dissipation in 3D MHD Simulations of the Kelvin–Helmholtz Instability"
   Salvesen, G., Beckwith, K., Simon, J. B., O'Neill, S. M., Skillman, S. W., & Begelman, M. C. 2012, 219$^{\text{th}}$ Meeting of the AAS, Austin, TX
3. "Shocks in Galaxy Cluster X-ray Temperature Images"
   Salvesen, G., Henning, J. W., Skillman, S. W., & Burns, J. O. 2011, 217$^{\text{th}}$ Meeting of the AAS, Seattle, WA
2. "The Inner Accretion Disk of the Black Hole Binary Transient XTE J1650–500" (Poster)
   Salvesen, G., Miller, J. M., Reis, R. C., & Homan, J. 2010, 215$^{\text{th}}$ Meeting of the AAS, Washington, DC
1. "Shock Speed, Cosmic Ray Pressure, and Temperature in the Cygnus Loop" (Poster)
   Salvesen, G., Raymond, J. C., & Edgar, R. J. 2009, 213$^{\text{th}}$ Meeting of the AAS, Long Beach, CA

Supercomputing Usage and Time Allocations

Co-I, 3.3M SU, `Janus` Supercomputer, *Local Simulations of Magnetized Accretion Disks*	Mar 2016 – Jan 2017
Co-I, 11.2M SU, `Janus` Supercomputer, *Dynamo Activity in Strongly Magnetized Accretion Disks*	Mar 2014 – Dec 2015
User, 5.2M SU, `Janus` Supercomputer, *Local Simulations of Accretion Disk Coronae*	Feb 2013 – Feb 2014
User, 5.2M SU, `Janus` Supercomputer, *Instabilities in Relativistic, Magnetized, Astrophysical Jets*	Feb 2012 – Feb 2013
Test User, ∼10M SU, `Janus` Supercomputer, *Simulations of the Kelvin-Helmholtz Instability*	2011

Teaching and Mentoring

Ongoing development of accessible astronomy education materials	2018 – Present
Mentored Ms. Kristina Salgado for her undergraduate Honors Thesis, University of Colorado	Fall 2013 – Spring 2015
Guest lectured for the course "Black Holes" for undergraduate non-majors, University of Colorado	Fall 2013
Tutored weekly for undergraduate introductory astronomy courses, University of Michigan	2008 – 2009

Outreach

Founder of Astronomy Sound of the Month website (AstroSoM.com)	Jan 2018 – Present
Guest writer for Astrobites, a daily astrophysical literature journal aimed at undergraduates	Jan 2018
Regular speaker at Astronomy on Tap, fun public talks with chapters nationwide	Apr 2018; Mar, Jan 2017; Apr 2015
Guest on KGNU radio science show "How on Earth" in Boulder, CO	May 2016
Speaker at Nerd Nite, a monthly public lecture series in Denver, CO	Feb 2016
Host for public observing nights (2-3 times/year), University of Colorado Sommers-Bausch Observatory	2009 – 2016
Volunteer judge for Flagstaff Academy Science Fair in Longmont, CO	2010, 2011
Guest speaker on academic career paths for high school students, Andover High School	2010, 2011
Presenter for planetarium shows and observing nights open to the public (monthly), University of Michigan	2008 – 2009

Awards and Honors

⋆ NSF Astronomy & Astrophysics Postdoctoral Fellowship (9 fellowships, 92 applications)	Oct 2016 – Present
⋆ NASA Earth and Space Science Fellowship (8 fellowships, 134 applications)	Sep 2014 – Aug 2016
Graduate School Dissertation Completion Fellowship, University of Colorado	Declined in order to accept NESSF
Richard N. Thomas Award, JILA, University of Colorado	2014
Chambliss Astronomy Achievement Student Award, 223rd AAS Meeting	Jan 2014
⋆ NSF Graduate Research Fellowship	Sep 2010 – Sep 2013
Honorific Supplemental Fellowship, University of Colorado, APS Department	2009, 2010, 2011, 2012, 2014

Professional Memberships

American Astronomical Society, Full Member	2009 – Present
AAS High Energy Astrophysics Division, Member	2011 – Present

Professional Service

Peer-review Referee: *Monthly Notices of the Royal Astronomical Society*, *Astronomy & Astrophysics*, *Physical Review Letters*, *Physical Review E*, *Physics Letters A*

Panel Member for the *Chandra X-ray Observatory* Peer Review

Volunteer judge for AAS Chambliss poster awards	2014 – 2018
Colloquium Committee, University of Colorado, APS Department	Fall 2013 – Fall 2014
Comprehensive Exams Committee, University of Colorado, APS Department	Fall 2011 – Fall 2013
Graduate Concerns Committee, University of Colorado, APS Department	Fall 2009 – Fall 2010

Skills

Programming and software fluency in `Python`, `Bash`, `IDL`, `Athena` (MHD code), `XSPEC`, `ds9`, `yt`, LaTeX
Experience with `C/C++`, `MATLAB`, `Mathematica`, `OpenMPI` (super computing), `Mercurial` (version control)
Proficient in web development `HTML5/CSS/PHP/JavaScript`
Proficient in basics of French language

References

Prof. Mitchell C. Begelman, JILA, University of Colorado Boulder, mitch@jila.colorado.edu, (303) 492-7856
Prof. Philip J. Armitage, JILA, University of Colorado Boulder, pja@jilau1.colorado.edu, (303) 492-7836
Prof. Jon M. Miller, University of Michigan, Ann Arbor, jonmm@umich.edu, (734) 764-4185