Prof. Yuanyuan Su – Curriculum Vitae – by May 2019

Contact Information

Department of Physics & Astronomy
University of Kentucky
33 Chemistry–Physics Building
Lexington KY 40506

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E-mail: yuanyuan.su8@gmail.com
http://hea-www.cfa.harvard.edu/~ysu

Languages English, Chinese (native), Japanese (JLPT-N2)

Professional Experience

Assistant Professor at **University of Kentucky**
January 2019 – present
Postdoctoral Fellow at **Harvard-Smithsonian Center for Astrophysics**
August 2015 – December 2018
Postdoctoral Scholar at **University of California, Irvine**
September 2013 – July 2015
Research Assistant at **University of Alabama**
September 2008 – July 2013

Education

Ph.D. Astrophysics, University of Alabama, December 2013
Dissertation title: "X-ray observations of hot gas in groups and early-type galaxies"
B.Sc. Physics, Sichuan University, June 2007

PI Proposals

20 Accepted Proposals as the Principal Investigator

2018 **XMM-Newton** AO 18 –**48 ksec** – NGC 3258, NGC 3258-SW

2018 **JVLA** –**14.50 hours** – NGC 4477

2018 **HISAKI** –**200 ksec** – NGC 5044 and Abell 2597

2017 **Chandra** AO 19 – Archival proposal

2017 **Chandra** AO 19 –**45 ksec** – MKW4

2015 **XMM-Newton** AO 15 – **183 ksec** – Abell 1142

2015 **XMM-Newton** AO 15 – **73 ksec** – NGC 4342

2015 **Chandra** AO 17 – **200 ksec** – Abell 586

2015 **Suzaku** AO 10 – **100 ksec** – NGC 4342

2015 **Suzaku** AO 10 – **100 ksec** – Abell 586

2014 **Chandra** AO 16 – **10 ksec** – ESO3060170-S

2014 **Suzaku** AO 9 – **200 ksec** – RXJ1159+5531-E, RXJ1159-5531-W

2014 **Suzaku** AO 9 – **200 ksec** – ESO3060170-E, ESO3060170-W

2014 **Suzaku** AO 9 – **100 ksec** – MKW4-WN

2013 **XMM-Newton** AO 13 – **196 ksec** – ESO3060170-S, ESO3060170-E

2013 **Suzaku** AO 8 – **230 ksec** – MKW4, MKW4-N2, MKW4-W2

2011 **XMM-Newton** AO 11 – **90 ksec** – NGC 3608, NGC 5982

2011 **Chandra** AO 13 – **55 ksec** (Chandra), **30 ksec** (XMM-Newton, joint) –NGC 1400, NGC 1407-E

2011 **Suzaku** AO 6 – **100 ksec** – NGC 1407/1400

2010 **Suzaku** AO 5 – **110 ksec** – ESO3060170, ESO3060170-S

PI Grants **A Half Million US Dollars Awarded Grants as the Principal Investigator**

- 2017 – **$62,611**
  Chandra AO 19 – "Exploring the Largest Radii of the Smallest Cluster"
- 2017 – **$78,000**
  Chandra AO 19 – "A Systematic Study of Kelvin-Helmholtz Instability in Galaxy Clusters"
- 2016 – **$61,065**
  XMM-Newton AO 15 – "Unveiling a Mysterious Nearby Cool-Core Cluster Lacking a Central BCG"
- 2016 – **$77,625**
  Chandra AO 17 –"Mapping an unusually Relaxed Non-Cool-Core Cluster out to the Viral Radius"
- 2014 – **$25,568**
  Chandra AO 16 – "Investigating a Potential Benchmark of Relaxed Clusters out to the Virial Radius"
- 2014 – **$49,921**
  Suzaku AO 9 – "Mapping a Benchmark Relaxed Poor Cluster out to its Virial Radius with Suzaku"
- 2011 – **$68,288**
  XMM-Newton AO 11 – "The Metal Abundance of X-ray Faint Early-Type Galaxies: Effects of Dilution?"
- 2011 – **$37,471**
  Chandra AO 13 – "Joint *Chandra/XMM-Newton* Observations of NGC 1407/1400 Complex"
- 2010 – **$26,665**
  Suzaku AO 5 – "How do Fossil Groups of Galaxies Differ from Normal Groups"

ApJ: The Astrophysical Journal
http://iopscience.iop.org/0004-637X/
MNRAS: Monthly Notices of the Royal Astronomical Society
https://academic.oup.com/mnras

[21] "Extended X-ray study of M49: the frontier of the Virgo Cluster"

Su, Y., Kraft, R. P., Nulsen, P. E. J., Jones, C., Maccarone, T. J., Mernier, F., Lovisari, L., Randall, S. W., Sheardown, A., Roediger, E., Fish, T. M., Forman, W. R., Churazov, E. **ApJ in press arXiv:1904.11899**

[20] "A Unification of the Micro and Macro Physics in the Intracluster Medium of Nearby Clusters" **Astro2020 Science White Paper arXiv:1904.06739**

Su, Y., Kraft, R., Roediger, E., Nulsen, P., Sheardown, A., Fish, T., ZuHone, J., Churazo, E., Forman, W., Jones, C., Irwin, J., Randall, S.

[19] "RELICS: Reionization Lensing Cluster Survey" **ApJ submitted arXiv:1903.0200**

Coe, D., Salmon, B., Bradac, M. + **Su, Y.**

[18] "Misleading X-Ray Tails of Galaxies and Subclusters in Galaxy Clusters - Distinguishing Slingshot Tails and Ram Pressure Tails"

Sheardown, A., Fish, T. M., Roediger, E., Hunt, M., ZuHone, J. A., **Su, Y.**, Kraft, R. P., Nulsen, P. E. J., Churazov, E., Forman, W. R., Jones, C., Lyskova, N., Eckert, D., De Grandi, S. **ApJ in press arXiv:1903.00482**

[17] "The first astrophysical result of HISAKI: a search for He I lines in a massive cool core cluster at z=0.7"

Su, Y., Kimura, T., Kraft, R. P., Nulsen, P. E. J., Gralla, M., Forman, W. R., Murakami, G., Yamazaki, A., Yoshikawa, I. **ApJ submitted**

[16] "A Galaxy-scale Fountain of Cold Molecular Gas Pumped by a Black Hole"

Tremblay, G. R., Combes, F., Oonk, J. B. R., Russell, H. R., McDonald, M. A., Gaspari, M., Husemann, B., Nulsen, P. E. J., McNamara, B. R., Hamer, S. L., O'Dea, C. P., Baum, S. A., Davis, T. A., Donahue, M., Voit, G. M., Edge, A. C., Blanton, E. L., Bremer, M. N., Bulbul, E., Clarke, T. E., David, L. P., Edwards, L. O. V., Eggerman, D., Fabian, A. C., Forman, W., Jones, C., Kerman, N., Kraft, R. P., Li, Y., Powell, M., Randall, S. W., Salomé, P., Simionescu, A., **Su, Y.**, Sun, M., Urry, C. M., Vantyghem, A. N., Wilkes, B. J., ZuHone, J. A. **2018**, **ApJ**, 865, 13

http://iopscience.iop.org/article/10.3847/1538-4357/aad6dd/pdf

[15] "The Recent Growth History of the Fornax Cluster Derived from Simultaneous Sloshing and Gas Stripping: Simulating the Infall of NGC 1404"

Sheardown, A., Roediger, E., **Su, Y.**, Kraft, R. P., Fish, T., ZuHone, J. A., Forman, W. R., Jones, C., Churazov, E., Nulsen, P. E. J. **2018**, **ApJ**, 865, 118
http://iopscience.iop.org/article/10.3847/1538-4357/aadc0f/pdf

[14] "X-ray cavities in the hot corona of the lenticular galaxy NGC 4477"

Li, Y., **Su, Y.**, Jones, C. **2018**, **MNRAS**, 480, 4279
https://academic.oup.com/mnras/article/480/4/4279/5067879

[13] "Gas sloshing record and regulate the evolution of galaxy clusters"

Su, Y., Nulsen, P. E. J., Kraft, R., Jones, C., Forman, W., Roediger, E., Irwin, J., ZuHone, J., Randall, S., and Sheardown, A. **2017**, **ApJ**, 851, 69
http://iopscience.iop.org/article/10.3847/1538-4357/aa989e/pdf

[2] "Buoyant AGN bubbles in the quasi-isothermal potential of NGC 1399"

Su, Y., Nulsen, P. E. J., Kraft, R., Forman, W., Jones, C., Irwin, J., Randall, S., and Churazov, E. **2017**, **ApJ**, 847, 49
http://iopscience.iop.org/article/10.3847/1538-4357/aa8954/pdf

[11] "Stripped Elliptical Galaxies as Probes of ICM Physics. III. Deep Chandra Observations of NGC 4552: Measuring the Viscosity of the Intracluster Medium"

Kraft, R. P., Roediger, E., Machacek, M., Forman, W. R., Nulsen, P. E. J., Jones, C., Churazov, E., Randall, S., **Su, Y.**, Sheardown, A., **2017**, **ApJ**, 848, 27
http://iopscience.iop.org/article/10.3847/1538-4357/aa8a6e/pdf

[10] "Uplift, feedback and buoyancy: radio lobe dynamics in NGC 4472"

Gendron-Marsolais, M. Kraft, R. P., Bogdan, A., Forman, W. R., Hlavacek-Larrondo, J., Jones, C., **Su, Y.**, Nulsen, P., Randall, S. W., and Roediger, E., **2017**, **ApJ**, 848, 26
http://iopscience.iop.org/article/10.3847/1538-4357/aa8a6f/pdf

[9] "Deep Chandra observations of NGC 1404: cluster plasma physics revealed by an infalling early-type galaxy"

Su, Y., Kraft, R. P., Roediger, E., Nulsen, P. E. J., Forman, W. R., Churazov, E., Randall, S. W., Jones, C., and Machacek, M. E. **2017**, **ApJ**, 834, 74
http://iopscience.iop.org/article/10.3847/1538-4357/834/1/74/pdf

[8] "Capturing the 3D Motion of an Infalling Galaxy via Fluid Dynamics"

Su, Y., Kraft, R., Nulsen, P. E. J., Roediger, E., Forman, W. R., Churazov, E., Randall, S. W., Jones, C., and Machacek, M. E. **2017**, **ApJ**, 835, 19
http://iopscience.iop.org/article/10.3847/1538-4357/835/1/19/pdf

[7] "The Entire Virial Radius of the Fossil Cluster RXJ 1159 + 5531. II. Dark Matter and Baryon Fraction"

Buote, D., **Su, Y.**, Gastaldello, F., & Brighenti, F. **2016**, **ApJ**, 826, 2
http://iopscience.iop.org/article/10.3847/0004-637X/826/2/146/pdf

[6] "Chandra Observation of Abell 1142: a Cool-Core Cluster Lacking a Central Brightest Cluster Galaxy"

Su, Y., Buote, D., Gastaldello, F., & van Weeren R. **2016**, **ApJ**, 821,40
http://iopscience.iop.org/article/10.3847/0004-637X/821/1/40/pdf

[5] "The Entire Virial Radius of the Fossil Cluster RXJ1159+5531: I. Gas Properties"

Su, Y., Buote, D., Gastaldello, F., & Brighenti, F. **2015**, **ApJ**, 805, 104
http://iopscience.iop.org/0004-637X/805/2/104/pdf/apj_805_2_104.pdf

[4] "The Scatter in the Hot Gas Content of Early-Type Galaxies"

Su, Y., Irwin, J., White, R., & Cooper, M. **2015**, **ApJ**, 806, 156
http://iopscience.iop.org/article/10.1088/0004-637X/806/2/156/pdf

[3] "Joint XMM-Newton and Chandra Observations of the NGC1407/1400 Complex: a Tail of an Early-Type Galaxy and a Tale of a Nearby Merging Group"

Su, Y., Gu, L., White, R., Irwin, J. **2014**, **ApJ**, 786, 152
http://iopscience.iop.org/0004-637X/786/2/152/pdf/apj_786_2_152.pdf

[2] "Suzaku Observations to the Virial Radius of Fossil Group ESO3060170"

Su, Y., White, R., & Miller, E. **2013**, **ApJ**, 775, 89
http://iopscience.iop.org/article/10.1088/0004-637X/775/2/89/pdf

[1] "Investigating the Potential Dilution of the Metal Content of Hot Gas in Early-Type Galaxies by Accreted Cold Gas"

Su, Y. & Irwin J. **2013**, **ApJ**, 766, 61
http://iopscience.iop.org/article/10.1088/0004-637X/766/1/61/pdf

Professional Society
American Astronomical Society
American Physical Society

Services

Referee of Nature

Chandra review panelist

NuSTAR review panelist

Referee of Monthly Notices of the Royal Astronomical Society

Referee of the Astrophysical Journal

Contributed to review of paper submitted to Physical Review Letters

2015–2018 Organizer of the weekly galaxy cluster group meeting at the Harvard-Smithsonian CfA (consisting of more than 30 scientists from the CfA, MIT, Tufts Univ., and Boston Univ.)

2015–2018 Co-Organizer of the weekly High Energy Seminar at the Harvard-Smithsonian CfA
https://www.youtube.com/channel/UCMFEeX24_lviXNhek5-FFLA

Students Supervised
REU: Research Experiences for Undergraduates
https://www.nsf.gov/crssprgm/reu/

Megan Masterson, Case Western Reserve University, now at University of Cambridge and MIT
2018 REU program at the CfA
Project: Using Chandra X-ray Observations to Determine the Physical Properties of G211.21+38.66, a Planck-Detected, Merging Galaxy Cluster at z = 0.505
AAS Chambliss Award in 2019
Gates Cambridge scholarship

Alexander Jones, University of Southampton, now at University of Hamburg
2017–2018, Master student on year abroad at the CfA
Project: Abell 1142 and the Missing Central Galaxy – A Cluster In Transition?

Yijia Li, Nanjing University, now at Penn State University
2017 REU program at the CfA
Project: X-ray cavities in the hot coronae of the lenticular galaxy NGC 4477

Hannah Richstein, Texas Christian University, now at University of Virginia
2017 REU program at the CfA
Project: Abell 586: a remarkably relaxed non-cool-core cluster

Isabella Trierweiler, Yale University, now at UCLA
2016 REU program at the CfA
Project: The impact of large scale environments on cluster entropy profiles

Awards

2015 University of Alabama Graduate School's Outstanding Dissertation, $1,000

2015 University of Alabama College of Arts & Sciences' Outstanding Dissertation, $500

2015 University of Alabama Dept. of Physics & Astronomy's Outstanding Dissertation, $100

2014 University of Alabama Dept. of Physics & Astronomy's Outstanding Research by a Doctoral Student, $100

2012–2013 Graduate Council Research Fellowship, University of Alabama, $37,000

2003 Highschool Physics Contest, 1st Prize, Sichuan, China

2000 Middle school Physics Contest, 2nd Prize, Sichuan, China

Outreach Activities

Public Talk: "Our hot and energetic Universe"
December 2018, Japanese students oversea program (Shizuoka Highschool), Harvard University

Tour Guide of the Operations Control Center of Chandra
July 2018, Public Outreach Program, MIT/SAO

Public Talk: "Our hot and energetic Universe"
December 2017, Japanese students oversea program (Shimizu Higashi Highschool), Harvard University

Tour Guide of the Operations Control Center of Chandra
July 2017, Public Outreach Program, MIT/SAO

Public Talk: "We are in the Universe and the Universe is in us"
March 2017, Japanese students oversea program (Shukutoku Highschool), Harvard University

Light & Color Filter Activity
April 2017, Cambridge Explores the Universe, Smithsonian Astrophysical Observatory

Guest Talk: SOFIA-Stratospheric Observatory for Infrared Astronomy
Jun 2013, Meeting of Astrophysics Students at Stanford, Stanford University

Guest Talk: Philosophy of Science
Jan 2013, Meeting of Astrophysics Students at Stanford, Stanford University

Public Talk: Black Holes
March 2010, "A Space Oddity" Creative Campus event, University of Alabama

Presentations **Conference Talks & Seminars**

"Searching for Warm Gas in a Cool-Core Cluster Using the Hisaki Planet Observatory"
Invited to "Galaxy and Cosmology Seminar", CfA, January, 2018

Invited to "The SnowCluster 2018 meeting", Utah, March, 2018

High energy seminar at MIT, Cambridge, MA, November, 2017

"Stirring up the hot gas in galaxy clusters"
KIPAC tea talk, Stanford, CA, Oct 2017

"Through the X-ray looking glass, what cluster physics found there"
Berkeley Lunch Talk, Berkeley, CA, Oct 2017

"Through the X-ray looking glass, what plasma physics found there"
16th HEAD meeting, Sun Valley, ID, Aug 2017

Invited to Astronomy Seminar at CEA Saclay, France in Feb 2017

Invited to "The remarkable life of a BCG" conference at Sexten/Sesto, Italy in Feb 2017

Invited to Astronomy Seminar at Bologna University in Italy in Feb 2017

"A closer look at the growth of clusters of galaxies"
Postdoc symposium, Center for Astrophysics, Cambridge, MA, Oct 2016

"The Best Constraints on the Transport Processes in the Intracluster Medium"
APS April Meeting 2016, Salt Lake City, UT, Apr 2016

"Merging and transport Phenomena in the Intracluster Medium"
High Energy Seminar, Center for Astrophysics, Cambridge, Feb, 2016

"A very Deep Chandra Observation of NGC 1404: the Best Constraints on the Transport Processes in the Intracluster Medium"
227th AAS, Kissimmee, FL, Jan 2016

"Fossil groups: a billion years of solitude"
Postdoc symposium, Center for Astrophysics, Cambridge, MA, Oct 2015

"X-raying the Hierarchy Universe"
Invited talk, Center for Astrophysics, Cambridge, MA, Apr 2015

"The Important Role of Dark Matter Halo in Retaining Hot Gas Content in Early-type Galaxies"
14th HEAD meeting, Chicago, IL, Aug 2014

"Mapping fossil and non-fossil systems out to their virial radii"
The X-ray Universe, Dublin, Ireland, Jun 2014

"Galaxy clusters in X-ray"
Invited Talk, Shanghai Observatory, Shanghai, China, Apr 2014

"Chandra, Suzaku, and XMM-Newton observations of galaxy clusters"
Invited Talk, Purple Mountain Observatory, Nanjing, China, Mar 2014

"X-ray observations of galaxy clusters"
Astrophysics Seminars, University of California, Irvine, CA, Jan 2014

"Suzaku Observations of the X-Ray Brightest Fossil Group ESO 3060170"
222th AAS, Long Beach, CA, Jan 2013

"X-ray observations of diffuse emission in early-type galaxies and groups"
Cosmology Seminars, Stanford University, CA, August 2012

"Suzaku Observations to the Virial Radius of Fossil Group ESO3060170"
220th AAS meeting, Anchorage, AK, June 2012

"Fe abundance of hot gas in early-type galaxies"
219th AAS meeting, Austin, TX, January 2012

"X-ray observations of hot gas in groups and early-type galaxies"
Seminar, Center for Astrophysics, Cambridge, MA, August 2011

"Suzaku observations of the X-ray brightest fossil group"
4th Suzaku meeting Stanford, CA, July 2011