

Curriculum Vitae
CHRISTOPHER STEPHEN REYNOLDS

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General information

Current positions/roles

- 7/2023– *Professor*, Dept. of Astronomy, Univ. of Maryland, College Park, MD, USA
7/2023– *Director*, Joint Space Science Institute (JSI), Univ. of Maryland

Previous positions/roles

Employment :

- 9/2017–6/2023 *Plumian Professor of Astronomy*, University of Cambridge
10/2018 –6/2023 *Fellow*, Sidney Sussex College, University of Cambridge
10/2018 –9/2022 *Deputy Director*, Institute of Astronomy, University of Cambridge
7/2009–8/2017 *Professor*, Dept. of Astronomy, Univ. of Maryland, College Park, MD, USA
7/2005–6/2009 *Associate Professor*, Dept. of Astronomy, Univ. of Maryland
8/2001–6/2005 *Assistant Professor*, Dept. of Astronomy, Univ. of Maryland
8/1998–7/2001 *Senior Research Associate & Hubble Fellow*, JILA, Univ. of Colorado, Boulder, CO, USA
10/1996–7/1998 *Postdoctoral Research Associate*, JILA, Univ. of Colorado

Other roles :

- 8/2013–8/2014 *Director*, Astronomy Center for Theory and Computation, Univ. of Maryland
8/2012–8/2014 Faculty Senator, Univ. of Maryland
3/2010–8/2013 *Director*, Joint Space Science Institute (JSI), Univ. of Maryland
8/2008–8/2009 *Director*, Astronomy Center for Theory and Computation, Univ. of Maryland

Selected honours and awards

- 2024 McDonnell Distinguished Lecturer (Washington University St. Louis)
2019–2024 ERC Advanced Grant (project DISKtoHALO)
2019 NASA Group Achievement Award (for the *Lynx* project)
2014–2015 Simons Fellow in Theoretical Physics
2013 Hintze Lecturer (Univ. of Oxford)
2012 Biermann Lecturer (Max Planck Institute for Astrophysics, Garching, Germany)
2005 Helen B. Warner Prize (top early-career award from American Astronomical Society)
1998–2001 Hubble Fellowship (NASA)
1993 Tyson Medal for top astrophysics performance in Part III Maths (Univ. of Cambridge)

Education

- 10/1993–9/1996 *Ph.D.*, Institute of Astronomy, Univ. of Cambridge
1/1996 *Master of Arts*, Trinity College, Univ. of Cambridge
10/1992–6/1993 *Certificate of Advanced Study in Mathematics* (“Part III Maths”), Univ. of Cambridge
10/1989–6/1992 *B.A. (Theoretical Physics)*, Trinity College, Univ. of Cambridge

Research Profile

Reynolds leads a research group focused on the astrophysics of black holes and related high-energy processes. Specific current interests include (i) the imprints of strong gravity on X-ray spectral and timing data and subsequent constraints on black hole spin; (ii) observational constraints and theoretical models for winds from AGN; (iii) the theory of black hole accretion, connecting the modern MHD-turbulence paradigm for accretion disks to observables; (iv) observational constraints on AGN feedback in massive galaxies and galaxy clusters; (v) theoretical models of AGN feedback and the relevant plasma physics of the intracluster medium, (vi) astrophysical probes of particle physics beyond the Standard Model (particularly constraints on axion-like particles), (vii) development of future X-ray observatories.

Throughout his career, Reynolds has integrated students of all levels (undergraduate, masters, and PhD) as well as early career postdoctoral researchers into his research group. To date, he has mentored 13 PhD students through to graduation, with another 4 PhD students currently working with him in Cambridge. He has been the primary research advisor for 19 early career postdoctoral research associates and fellows.

Publications and Talks

Reynolds has authored or co-authored over 340 published peer-reviewed papers. Please click [here](#) for a full current publication list (via the NASA Abstract Data Service) or see attached document. As of 12-Mar-2024, his published works have been cited 28,000 times in the scientific literature (leading to an *h*-index of 83). A full publication list is attached to this CV.

Reynolds has given a total of 187 invited research talks. A full talk list is attached to this CV.

Research Funding

During his 22 years working in the US, Reynolds secured US\$5.3M of Federal funding across 45 separate research awards from NASA and the National Science Foundation. (numbers do not include the Federally-funded independent graduate and postdoctoral fellowships for which he acted as host). While at the University of Cambridge (2017–2023), he was awarded GB£400k from the UK Government Science and Technology Facilities Council (STFC) to support his theoretical work on accretion disks as part of the IoA Consolidated Grant. In 2019, he was awarded an Advanced grant (2.5M euros) from the European Research Council to support a suite of projects focused on AGN feedback. Now back at the University of Maryland, he has become Principal Investigator of the Advanced X-ray Imaging Satellite (AXIS), a response to the NASA call for probe-class (\$1B) observatories.

Major collaborations

2022–present	Principal Investigator, Advanced X-ray Imaging Satellite (AXIS)
2016–2021	Member of Advanced X-ray Imaging Satellite (AXIS) Science Team
2018–present	Member of NASA HelioSwarm team (focused on turbulence in solar wind plasma)
2016–2020	Member of NASA/Lynx Science and Technology Definition Team
2015–2019	“NASA-Nominated” Member of <i>Athena</i> Science Team
2013–2015	Member of NASA/NuSTAR Science Team
2009–2016	“NASA Selected Science Advisor” for the NASA/JAXA <i>Astro-H/Hitomi</i> mission
2002–2010	Member of NASA/Swift Science Team
1998–2009	Member of NASA <i>Constellation-X/International X-ray Observatory</i> Science Team

Significant Community Committee Service

Reynolds has served on a number of oversight and strategic planning committees, as well as held elected office within the High-Energy Astrophysics Division (HEAD) of the American Astronomical Society (AAS). Highlights include:

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| 2020–present | Co-Chair <i>Athena</i> /ESA Topical Panel on “Physics Beyond the Standard Model” |
| 2019–present | Scientific Advisory Board (Fachbeirat) for Max Planck Institute for Astrophysics, Garching. |
| 2018–2020 | Past Chair of HEAD/AAS |
| 2016–2018 | Chair of HEAD/AAS |
| 2014–2016 | Vice Chair of HEAD/AAS |
| 2013 | NASA Astrophysics 30-year Roadmapping Task Force |
| 2009–2010 | Astro-2010 (“Decadal Survey”) Science Frontier Panel on “Galaxies Across Cosmic Time” |
| 2006–2008 | Elected Member of the HEAD/AAS Executive Committee |
| 2003–2008 | NASA/Chandra Users Committee (Program Oversight; Chair from 2006–2008) |
| 1997–2020 | Served on approximately 30 NSF and NASA proposal/grant review panels |

Organization of scientific meetings

Reynolds has served on the Scientific Organizing Committee (SOC) or Local Organizing Committee (LOC) for over 30 international science conferences and symposia. He chaired or co-chaired the following meetings:

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| 2017 | Chair of SOC for 16th HEAD/AAS Meeting, Sun Valley, Idaho, USA |
| 2016 | Chair of SOC for 15th HEAD/AAS Meeting, Naples, Florida, USA |
| 2015 | Chair of SOC for Annual JSI Conference “SMBH Formation and Feedback”, Annapolis, MD, USA |
| 2013 | Chair of SOC for Annual JSI Conference “Putting Accretion Theory to the Test”, Annapolis, MD, USA |
| 2012 | Chair of LOC for “Energetic Astronomy”, Annapolis, MD, USA |
| 2011 | Co-Chair of SOC for Annual JSI Conference “Near Field Cosmology”, Annapolis, MD, USA |
| 2010 | Co-Chair of SOC for Annual JSI Conference “Ins and Outs of Black Holes”, Annapolis, MD, USA |
| 2008 | Chair of SOC for “Putting Gravity to Work: From Black Holes to Galaxy Clusters”, Cambridge, UK |
| 2004 | Chair of SOC for mini-workshop on “Black Hole Science with Con-X”, NASA-Goddard, MD, USA |

Peer Review

Reynolds is a regular reviewer of papers for the major astrophysics research journals including *Astronomy & Astrophysics*, *The Astrophysical Journal*, *Astrophysical Journal Letters*, *Monthly Notices of the Royal Astronomical Society*, *Nature*, *Physical Review Letters*, and *Science*. He also has served on approximately 1–2 in-person proposal review panels per year (most commonly for NASA and the National Science Foundation).

Selected Significant Research Outreach Activities

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| 2007 | Smithsonian Associates Talk (Freer Museum) “Black Holes: Not Just a Theory Anymore” (400+ attendees) |
| 2019 | Hay Festival, Hay-on-Wye, public talk on “Unravelling the Mysteries of Black Holes” (800+ attendees) |
| 2019 | Cambridge Science Festival, public talk on “The Universe of Black Holes” (300+ attendees) |

Teaching/Mentoring Related Activities

Formal Teaching

As a member of the professorial faculty at the University of Maryland (Aug-2001 to Aug-2017 and then again from Jul-2023 to present), Reynolds has taught for 25 semesters at all levels, ranging from General Astronomy for non-majors to specialized courses in high-energy astrophysics and cosmology for Senior Undergraduate students and Graduate students.

During his time as a Professor at the University of Cambridge, Reynolds lectured on Astrophysical Fluid Dynamics for undergraduates in the Part II (3rd year) Astrophysics of the Natural Sciences Tripos. Reynolds also served as an Examiner for Part II Astrophysics was Senior Examiners of this course in 2020. He also supervised (aka tutored) second year undergraduate Physics in Sidney Sussex College from 2018–2023, and served as the Director of Studies (aka academic advisor) for the astrophysics students and (in 2021) the first-year physical scientists.

Research students supervised by Reynolds

Laura Brenneman	(UMD; PhD 2007; Chair of High-Energy Astro.; Harvard-Smithsonian CfA)
Elyse Casper	(UMD; MPhil 2007)
David Garofalo	(UMD; PhD 2008; Professor at Kennesaw State University, Georgia, USA)
John Vernaleo	(UMD; PhD 2008; Vice President of Engineering at Bloq, Inc)
Lisa WInter	(UMD; PhD 2008; Program Manager at the National Science Foundation)
Barbara Mattson	(UMD; PhD 2008; Astrophysics Communication Scientist at NASA-GSFC)
Edmund Hodges-Kluck	(UMD; PhD 2011; Civil Servant at NASA-Goddard, Greenbelt, MD)
Kareen Sorathia	(UMD; PhD 2011; Computational Physicist at JHU Applied Physics Lab, MD)
Anne Lohfink	(UMD; PhD 2014; Associate Professor at Montana State University, USA)
Mark Avara	(UMD; PhD 2017; Postdoc at Georgia Institute of Technology)
Gabriele Betancourt-Martinez	(UMD; PhD 2017; Program Officer at Heising-Simons Foundation)
James Hogg	(UMD; PhD 2018; working in data science sector)
Gareth Roberg-Clark	(UMD; PhD 2019; Postdoc at the Max-Planck-Institut für Plasmaphysik)
Christopher Bambic	(Cambridge; MPhil 2019; Graduate student at Princeton)
Corbin Taylor	(UMD PhD candidate 2021; now with Amazon AWS)
Robyn Smith	(UMD PhD 2022; Data Scientist at Federal Reserve Bank of Philadelphia)
Sam Turner	(Cambridge PhD 2023; Postdoc in Dept of Applied Maths, Cambridge)
Payton Rodman	(Cambridge; expect PhD 2024; Gates scholar at IoA Cambridge)
Julia Sisk-Reynes	(Cambridge; expect PhD 2024; STFC scholar at IoA Cambridge)
Annabelle Richard-Laferriere	(Cambridge; expect PhD 2025; Gates scholar at IoA Cambridge)
Erika Hoffman	(UMD; current third year in PhD program)
Yash Gursahani	(UMD; current first year in PhD program)

Postdoctoral researchers supervised by Reynolds

Barry McKernan	(UMD 2003–2006; Professor at BMCC, New York City, USA)
Tamara Bogdanovic	(UMD 2006–2012; Associate Professor at Georgia Tech, Atlanta, USA)
Sean O'Neill	(UMD 2007–2010; Visiting Asst. Professor at Pacific Lutheran Univ., WA, USA)
Margaret Trippe	(UMD 2009–2012; Staff at JHU Applied Physics Lab, USA)
Abdu Zoghbi	(UMD 2010–2013; Research Faculty at University of Michigan, USA)
Francesco Tombesi	(UMD 2010–2016; Professor in Rome, Italy)
Javier Garcia	(UMD 2011–2012; Research Professor at Caltech, USA)
Roman Shcherbakov	(UMD 2011–2014; working in data science sector North Carolina, USA)
Brian Morsony	(UMD 2014–2017; Assistant Professor at California State, Stanislaus)
Karen Yang	(UMD Einstein Fellow 2014–2017; Assistant Professor at NTHU, Taiwan)
Erin Kara	(UMD Hubble Fellow 2015–2018; Assistant Professor at MIT)
Sergey Komarov	(Cambridge postdoc 2018–2021)
Sergei Dyda	(Cambridge postdoc 2018–2021; Postdoctoral Fellow at University of Virginia)
James Matthews	(Cambridge Herchel Smith Fellow 2019–2022; Hintze Fellow in Oxford)
Michael Parker	(Cambridge postdoc 2021?2023 ; currently AI Principal Scientist at Optibrium)
Prakriti Pal Choudhury	(Cambridge ERC postdoc 2020–2023; postdoc in plasma physics at Oxford)
Mark Avara	(Cambridge ERC postdoc 2020?2023; currently postdoc at Georgia Tech)
Jiachen Jiang	(Cambridge 2021–; Leverhulme Trust Early Career Fellow)
Greg Marcel	(Cambridge ERC postdoc 2021–)
Vanessa Lopez-Barquero	(Cambridge/UMD 2021–)
Amelia (Lia) Hankla	(UMD 2023–; JSI/Gehrels Postdoc Fellow)

Undergraduate researchers supervised by Reynolds

Philip Cowperthwaite	(UMD; graduated 2013; now freelance photographer in Frederick MD)
Allison Bostrom	(UMD; graduated 2015)
Jennifer Liang	(UMD; graduated 2016)
Christopher Bambic	(UMD; graduated 2018; Graduate student at Princeton)
Henry Dickey	(Cambridge; graduated 2018)
Harry Rendell	(Cambridge; graduated 2019; now PhD student in Edinburgh)
Megan Masterson	(Cambridge; graduated 2020; now PhD student at MIT)
Alex Osbourne	(Cambridge MAST 2022)
Hannah McCright	(UMD 2024–)
Joshua Robbins	(UMD 2024–)

Other institutional service

While in UMD-Astronomy, Reynolds served in several key roles, including: Graduate Admissions Committee (2002, 2003/chair, 2008, 2013); Graduate Qualifier Exam Committee (2005); Graduate Program Review Committee (2015/chair), Equity and Diversity Committee (2016), Faculty Search Committees (2003, 2009/chair, 2011/chair); and Strategic Planning Committee (2016/chair). In Cambridge, Reynolds took the lead role in preparing the Institute of Astronomy's submission to the UK Government's Research Excellence Framework (REF) process. He was also an active member of the Institute's Equity and Inclusiveness Committee, and Chaired the Institute of Astronomy Forum on Racial Equality.

Publication List for Christopher S. Reynolds

Reynolds has authored or co-authored over 340 published peer-reviewed papers. Please click [here](#) for a full current publication list (via the NASA Abstract Data Service) or see attached document. As of 12-Mar-2024, his published works have been cited 28,000 times in the scientific literature (leading to an *h*-index of 83).

For clarity, Reynolds's first author papers are underlined. Reynolds's policy is to promote his graduate students and junior postdocs into first authorship positions whenever possible, with Reynolds taking a co-author slot even when he provided the scientific leadership of the work — works for which this is the case have been marked with a dagger (\dagger).

Publications in refereed journals

1. *A cooling flow around the low-redshift quasar H1821+643*
Russell, H. R., Nulsen, P. E. J., Fabian, A. C., Braben, T. E., Brandt, W. N., Clews, L., McDonald, M., Reynolds, C. S., Sanders, J. S., & Veilleux, S. (2024), *Monthly Notices of the Royal Astronomical Society*, 528, 1863
2. \dagger *Evolution of the Magnetic Field in High- and Low- β Disks with Initially Toroidal Fields*
Rodman, P. E., & Reynolds, C. S. (2024), *The Astrophysical Journal*, 960, 97
3. *HelioSwarm: A Multipoint, Multiscale Mission to Characterize Turbulence*
Klein, K. G., Spence, H., Alexandrova, O., Argall, M., Arzamasskiy, L., Bookbinder, J., Broeren, T., Caprioli, D., Case, A., Chandran, B., Chen, L.-J., Dors, I., Eastwood, J., Forsyth, C., Galvin, A., Genot, V., Halekas, J., Hesse, M., Hine, B., Horbury, T., Jian, L., Kasper, J., Kretzschmar, M., Kunz, M., Lavraud, B., Le Contel, O., Mallet, A., Maruca, B., Matthaeus, W., Niehof, J., O'Brien, H., Owen, C., Retinò, A., Reynolds, C., Roberts, O., Schekochihin, A., Skoug, R., Smith, C., Smith, S., Steinberg, J., Stevens, M., Szabo, A., TenBarge, J., Torbert, R., Vasquez, B., Verscharen, D., Whittlesey, P., Wickizer, B., Zank, G., & Zweibel, E. (2023), *Space Science Reviews*, 219, 74
4. *Constraints on thermal conductivity in the merging cluster Abell 2146*
Richard-Laferrière, A., Russell, H. R., Fabian, A. C., Chadayammuri, U., Reynolds, C. S., Canning, R. E. A., Edge, A. C., Hlavacek-Larrondo, J., King, L. J., McNamara, B. R., Nulsen, P. E. J., & Sanders, J. S. (2023), *Monthly Notices of the Royal Astronomical Society*, 526, 6205
5. *The evolution of galaxies and clusters at high spatial resolution with AXIS*
Russell, H. R., Lopez, L. A., Allen, S. W., Chartas, G., Choudhury, P. P., Dupke, R. A., Fabian, A. C., Flores, A. M., Garofali, K., Hodges-Kluck, E., Koss, M. J., Lanz, L., Lehmer, B. D., Li, J.-T., Maksym, W. P., Mantz, A. B., McDonald, M., Miller, E. D., Mushotzky, R. F., Qiu, Y., Reynolds, C. S., Tombesi, F., Tozzi, P., Trindade-Falcao, A., Walker, S. A., Wong, K.-W., Yukita, M., & Zhang, C. (2023), *arXiv e-prints*, arXiv:2311.07661
6. \dagger *A new 2D stochastic methodology for simulating variable accretion discs: propagating fluctuations and epicyclic motion*
Turner, S. G. D., & Reynolds, C. S. (2023), *Monthly Notices of the Royal Astronomical Society*, 525, 2287
7. *An XMM-Newton study of six narrow-line Seyfert 1 galaxies at $z = 0.35\text{--}0.92$*
Yu, Z., Jiang, J., Bambi, C., Gallo, L. C., Grupe, D., Fabian, A. C., Reynolds, C. S., & Brandt, W. N. (2023), *Monthly Notices of the Royal Astronomical Society*, 522, 5456

8. *AGN feeding and feedback in M84: from kiloparsec scales to the Bondi radius*
Bambic, C. J., Russell, H. R., Reynolds, C. S., Fabian, A. C., McNamara, B. R., & Nulsen, P. E. J. (2023), *Monthly Notices of the Royal Astronomical Society*, 522, 4374
9. *†Physics Beyond the Standard Model with Future X-Ray Observatories: Projected Constraints on Very-light Axion-like Particles with Athena and AXIS*
Sisk-Reynés, J., Reynolds, C. S., Parker, M. L., Matthews, J. H., & Marsh, M. C. D. (2023), *The Astrophysical Journal*, 951, 5
10. *Vertical wind structure in an X-ray binary revealed by a precessing accretion disk*
Kosec, P., Kara, E., Fabian, A. C., Fürst, F., Pinto, C., Psaradaki, I., Reynolds, C. S., Rogantini, D., Walton, D. J., Ballhausen, R., Canizares, C., Dyda, S., Stauber, R., & Wilms, J. (2023), *Nature Astronomy*, 7, 715
11. *†Current and Future constraints on Very-Light Axion-Like Particles from X-ray observations of cluster-hosted Active Galaxies*
Sisk-Reynés, J. M., Reynolds, C. S., & Matthews, J. H. (2023), *arXiv e-prints*, arXiv:2304.08513
12. *UV-Optical Disk Reverberation Lags despite a Faint X-Ray Corona in the Active Galactic Nucleus Mrk 335*
Kara, E., Barth, A. J., Cackett, E. M., Gelbord, J., Montano, J., Li, Y.-R., Santana, L., Horne, K., Alston, W. N., Buisson, D., Chelouche, D., Du, P., Fabian, A. C., Fian, C., Gallo, L., Goad, M. R., Grupe, D., González Buitrago, D. H., Hernández Santisteban, J. V., Kaspi, S., Hu, C., Komossa, S., Kriss, G. A., Lewin, C., Lewis, T., Loewenstein, M., Lohfink, A., Masterson, M., McHardy, I. M., Mehdipour, M., Miller, J., Panagiotou, C., Parker, M. L., Pinto, C., Remillard, R., Reynolds, C., Rogantini, D., Wang, J.-M., Wang, J., & Wilkins, D. (2023), *The Astrophysical Journal*, 947, 62
13. *Line-driven winds from variable accretion discs*
Kirilov, A., Dyda, S., & Reynolds, C. S. (2023), *Monthly Notices of the Royal Astronomical Society*, 520, 44
14. *A Case for Electron-Astrophysics*
Verscharen, D., Wicks, R. T., Alexandrova, O., Bruno, R., Burgess, D., Chen, C. H. K., D'Amicis, R., De Keyser, J., de Wit, T. D., Franci, L., He, J., Henri, P., Kasahara, S., Khotyaintsev, Y., Klein, K. G., Lavraud, B., Maruca, B. A., Maksimovic, M., Plaschke, F., Poedts, S., Reynolds, C. S., Roberts, O., Sahraoui, F., Saito, S., Salem, C. S., Saur, J., Servidio, S., Stawarz, J. E., Štverák, Š., & Told, D. (2022), *Experimental Astronomy*, 54, 473
15. *X-Ray Reverberation Mapping of Ark 564 Using Gaussian Process Regression*
Lewin, C., Kara, E., Wilkins, D., Mastroserio, G., García, J. A., Zhang, R. C., Alston, W. N., Connors, R., Dauser, T., Fabian, A., Ingram, A., Jiang, J., Lohfink, A., Lucchini, M., Reynolds, C. S., Tombesi, F., Klis, M. van der, & Wang, J. (2022), *The Astrophysical Journal*, 939, 109
16. *The Long Stare at Hercules X-1. I. Emission Lines from the Outer Disk, the Magnetosphere Boundary, and the Accretion Curtain*
Kosec, P., Kara, E., Fabian, A. C., Fürst, F., Pinto, C., Psaradaki, I., Reynolds, C. S., Rogantini, D., Walton, D. J., Ballhausen, R., Canizares, C., Dyda, S., Stauber, R., & Wilms, J. (2022), *The Astrophysical Journal*, 936, 185
17. *†Probing the Extent of Fe K α Emission in Nearby Active Galactic Nuclei Using Multi-order Analysis of Chandra High Energy Transmission Grating Data*
Masterson, M., & Reynolds, C. S. (2022), *The Astrophysical Journal*, 936, 66

18. *The effect of returning radiation on relativistic reflection*
Dauser, T., García, J. A., Joyce, A., Licklederer, S., Connors, R. M. T., Ingram, A., Reynolds, C. S., & Wilms, J. (2022), *Monthly Notices of the Royal Astronomical Society*, 514, 3965
19. †*Acoustic waves and g-mode turbulence as energy carriers in a viscous intracluster medium*
Choudhury, P. P., & Reynolds, C. S. (2022), *Monthly Notices of the Royal Astronomical Society*, 514, 3765
20. *Black hole spin measurements based on a thin disc model with finite thickness - I. An example study of MCG-06-30-15*
Jiang, J., Abdikamalov, A. B., Bambi, C., & Reynolds, C. S. (2022), *Monthly Notices of the Royal Astronomical Society*, 514, 3246
21. †*Evidence for a moderate spin from X-ray reflection of the high-mass supermassive black hole in the cluster-hosted quasar H1821+643*
Sisk-Reynés, J., Reynolds, C. S., Matthews, J. H., & Smith, R. N. (2022), *Monthly Notices of the Royal Astronomical Society*, 514, 2568
22. *XMM-Newton observations of the narrow-line Seyfert 1 galaxy IRAS 13224-3809: X-ray spectral analysis II*
Jiang, J., Dauser, T., Fabian, A. C., Alston, W. N., Gallo, L. C., Parker, M. L., & Reynolds, C. S. (2022), *Monthly Notices of the Royal Astronomical Society*, 514, 1107
23. †*How Do Magnetic Field Models Affect Astrophysical Limits on Light Axion-like Particles? An X-Ray Case Study with NGC 1275*
Matthews, J. H., Reynolds, C. S., Marsh, M. C. D., Sisk-Reynés, J., & Rodman, P. E. (2022), *The Astrophysical Journal*, 930, 90
24. *A unified accretion-ejection paradigm for black hole X-ray binaries. VI. Radiative efficiency and radio-X-ray correlation during four outbursts from GX 339-4*
Marcel, G., Ferreira, J., Petrucci, P.-O., Barnier, S., Malzac, J., Marino, A., Coriat, M., Clavel, M., Reynolds, C., Neilsen, J., Belmont, R., & Corbel, S. (2022), *Astronomy and Astrophysics*, 659, A194
25. †*New constraints on light axion-like particles using Chandra transmission grating spectroscopy of the powerful cluster-hosted quasar H1821+643*
Sisk-Reynés, J., Matthews, J. H., Reynolds, C. S., Russell, H. R., Smith, R. N., & Marsh, M. C. D. (2022), *Monthly Notices of the Royal Astronomical Society*, 510, 1264
26. *Relativistic X-Ray Reverberation from Super-Eddington Accretion Flow*
Thomsen, L. L., Dai, L., Kara, E., & Reynolds, C. (2022), *The Astrophysical Journal*, 925, 151
27. *A Spectroscopic Angle on Central Engine Size Scales in Accreting Neutron Stars*
Trueba, N., Miller, J. M., Fabian, A. C., Kaastra, J., Kallman, T., Lohfink, A., Ludlam, R. M., Proga, D., Raymond, J., Reynolds, C., Reynolds, M., & Zoghbi, A. (2022), *The Astrophysical Journal*, 925, 113
28. *Fourier formalism for relativistic axion-photon conversion with astrophysical applications*
Marsh, M. C. D., Matthews, J. H., Reynolds, C., & Carenza, P. (2022), *Physical Review D*, 105, 016013
29. *Ionized emission and absorption in a large sample of ultraluminous X-ray sources*
Kosec, P., Pinto, C., Reynolds, C. S., Guainazzi, M., Kara, E., Walton, D. J., Fabian, A. C., Parker, M. L., & Valtchanov, I. (2021), *Monthly Notices of the Royal Astronomical Society*, 508, 3569

30. *Whistler-regulated Magnetohydrodynamics: Transport Equations for Electron Thermal Conduction in the High- β Intracluster Medium of Galaxy Clusters*
Drake, J. F., Pfrommer, C., Reynolds, C. S., Ruszkowski, M., Swisdak, M., Einarsson, A., Thomas, T., Hassam, A. B., & Roberg-Clark, G. T. (2021), *The Astrophysical Journal*, 923, 245
31. *Probing the circumnuclear environment of NGC 1275 with high-resolution X-ray spectroscopy*
Reynolds, C. S., Smith, R. N., Fabian, A. C., Fukazawa, Y., Kara, E. A., Mushotzky, R. F., Noda, H., Tombesi, F., & Veilleux, S. (2021), *Monthly Notices of the Royal Astronomical Society*, 507, 5613
32. *Observational constraints on black hole spin*
Reynolds, C.S. (2021), *Annual Reviews of Astronomy and Astrophysics*, 59, 117
33. *Extreme Relativistic Reflection in the Active Galaxy ESO 033-G002*
Walton, D. J., Balokovic, M., Fabian, A. C., Gallo, L. C., Koss, M., Nardini, E., Reynolds, C. S., Ricci, C., Stern, D., Alston, W. N., Dauser, T., Garcia, J. A., Kosec, P., Reynolds, M. T., Harrison, F. A., & Miller, J. M. (2021), *Monthly Notices of the Royal Astronomical Society*, 506, 1557
34. *†Investigating the theory of propagating fluctuations with numerical models of stochastic accretion discs*
Turner, S. G. D., & Reynolds, C. S. (2021), *Monthly Notices of the Royal Astronomical Society*, 504, 469
35. *A Case for Electron-Astrophysics*
Verscharen, D., Wicks, R. T., Alexandrova, O., Bruno, R., Burgess, D., Chen, C. H. K., D'Amicis, R., De Keyser, J., de Wit, T. D., Franci, L., He, J., Henri, P., Kasahara, S., Khotyaintsev, Y., Klein, K. G., Lavraud, B., Maruca, B. A., Maksimovic, M., Plaschke, F., Poedts, S., Reynolds, C. S., Roberts, O., Sahraoui, F., Saito, S., Salem, C. S., Saur, J., Servidio, S., Stawarz, J. E., Štverák, Š., & Told, D. (2021), *Experimental Astronomy*,
36. *†2MASX J00423991 + 3017515: an offset active galactic nucleus in an interacting system*
Hogg, J. D., Blecha, L., Reynolds, C. S., Smith, K. L., & Winter, L. M. (2021), *Monthly Notices of the Royal Astronomical Society*, 503, 1688
37. *The awakening beast in the Seyfert 1 Galaxy KUG 1141+371 - I*
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Reynolds, C. S., & Fabian, A. C. (1997), *Monthly Notices of the Royal Astronomical Society*, 290, L1
320. *Geometrical and chemical dependence of K-shell X-ray features*
Matt, G., Fabian, A. C., & Reynolds, C. S. (1997), *Monthly Notices of the Royal Astronomical Society*, 289, 175
321. *The profile and equivalent width of the X-ray iron emission line from a disc around a Kerr black hole*
Dabrowski, Y., Fabian, A. C., Iwasawa, K., Lasenby, A. N., & Reynolds, C. S. (1997), *Monthly Notices of the Royal Astronomical Society*, 288, L11
322. *An X-ray spectral study of 24 type 1 active galactic nuclei*
Reynolds, C. S. (1997), *Monthly Notices of the Royal Astronomical Society*, 286, 513
323. *ASCA observations of the nearby galaxies Dwingeloo 1 and Maffei 1*
Reynolds, C. S., Loan, A. J., Fabian, A. C., Makishima, K., Brandt, W. N., & Mizuno, T. (1997), *Monthly Notices of the Royal Astronomical Society*, 286, 349

324. *An advection-dominated flow in the nucleus of M87*
Di Matteo, T., Reynolds, C. S., Fabian, A. C., Hwang, U., & Canizares, C. R. (1997), *Accretion Disks - New Aspects*, 487, 240
325. *The 'quiescent' black hole in M87*
Reynolds, C. S., Di Matteo, T., Fabian, A. C., Hwang, U., & Canizares, C. R. (1996), *Monthly Notices of the Royal Astronomical Society*, 283, L111
326. *The matter content of the jet in M87: evidence for an electron-positron jet*
Reynolds, C. S., Fabian, A. C., Celotti, A., & Rees, M. J. (1996), *Monthly Notices of the Royal Astronomical Society*, 283, 873
327. *The variable iron K emission line in MCG-6-30-15*
Iwasawa, K., Fabian, A. C., Reynolds, C. S., Nandra, K., Otani, C., Inoue, H., Hayashida, K., Brandt, W. N., Dotani, T., Kunieda, H., Matsuoka, M., & Tanaka, Y. (1996), *Monthly Notices of the Royal Astronomical Society*, 282, 1038
328. *A powerful and highly variable off-nuclear X-ray source in the composite starburst/Seyfert 2 galaxy NGC 4945.*
Brandt, W. N., Iwasawa, K., & Reynolds, C. S. (1996), *Monthly Notices of the Royal Astronomical Society*, 281, L41
329. *The Variable O,VIII Warm Absorber in MCG-6-30-15*
Otani, C., Kii, T., Reynolds, C. S., Fabian, A. C., Iwasawa, K., Hayashida, K., Inoue, H., Kunieda, H., Makino, F., Matsuoka, M., & Tanaka, Y. (1996), *Publications of the Astronomical Society of Japan*, 48, 211
330. *ROSAT PSPC observations of Cygnus A: X-ray spectra of the cooling flow and hotspots*
Reynolds, C. S., & Fabian, A. C. (1996), *Monthly Notices of the Royal Astronomical Society*, 278, 479
331. *ASCA PV observations of the Seyfert 1 galaxy MCG-6-30-15: rapid variability of the warm absorber*
Reynolds, C. S., Fabian, A. C., Nandra, K., Inoue, H., Kunieda, H., & Iwasawa, K. (1995), *Monthly Notices of the Royal Astronomical Society*, 277, 901
332. *On broad iron Kalpha lines in Seyfert 1 galaxies*
Fabian, A. C., Nandra, K., Reynolds, C. S., Brandt, W. N., Otani, C., Tanaka, Y., Inoue, H., & Iwasawa, K. (1995), *Monthly Notices of the Royal Astronomical Society*, 277, L11
333. *ASCA observations of the Seyfert 1 galaxies MRK 1040 and MS 0225.5+3121*
Reynolds, C. S., Fabian, A. C., & Inoue, H. (1995), *Monthly Notices of the Royal Astronomical Society*, 276, 1311
334. *Warm absorbers in active galactic nuclei*
Reynolds, C. S., & Fabian, A. C. (1995), *Monthly Notices of the Royal Astronomical Society*, 273, 1167
335. *ROSAT PSPC Observations of the SEYFERT-1 Galaxies ARAKELIAN:564 NGC985 KAZ:163 MARKARIAN:79 and RX:J2256.6+0525*
Brandt, W. N., Fabian, A. C., Nandra, K., Reynolds, C. S., & Brinkmann, W. (1994), *Monthly Notices of the Royal Astronomical Society*, 271, 958
336. *The Reflection-Dominated X-Ray Spectrum of NGC6552*
Reynolds, C. S., Fabian, A. C., Makishima, K., Fukazawa, Y., & Tamura, T. (1994), *Monthly Notices of the Royal Astronomical Society*, 268, L55

Selected Non-Refereed White Papers and Conference Proceedings

337. *Overview of the advanced x-ray imaging satellite (AXIS)*
Reynolds, C. S., Kara, E. A., Mushotzky, R. F., Ptak, A., Koss, M. J., Williams, B. J., Allen, S. W., Bauer, F. E., Bautz, M., Bogadhee, A., Burdge, K. B., Cappelluti, N., Cenko, B., Chartas, G., Chan, K.-W., Corrales, L., Daylan, T., Falcone, A. D., Foord, A., Grant, C. E., Habouzit, M., Haggard, D., Herrmann, S., Hodges-Kluck, E., Kargaltsev, O., King, G. W., Kounkel, M., Lopez, L. A., Marchesi, S., McDonald, M., Meyer, E., Miller, E. D., Nynka, M., Okajima, T., Pacucci, F., Russell, H. R., Safi-Harb, S., Strassun, K. G., Trindade Falcão, A., Walker, S. A., Wilms, J., Yukita, M., & Zhang, W. W. (2023), *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXIII*, 12678, 126781E
338. *The high-speed x-ray camera on AXIS*
Miller, E. D., Bautz, M. W., Grant, C. E., Foster, R., LaMarr, B., Malonis, A., Prigozhin, G., Schneider, B., Leitz, C., Herrmann, S., Allen, S. W., Chattopadhyay, T., Orel, P., Morris, G. R., Stueber, H., Falcone, A. D., Ptak, A., & Reynolds, C. (2023), *UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXIII*, 12678, 1267816
339. *HelioSwarm: A Multipoint, Multiscale Mission to Characterize Turbulence*
Klein, K. G., Spence, H., Alexandrova, O., Argall, M., Arzamasskiy, L., Bookbinder, J., Broeren, T., Caprioli, D., Case, A., Chandran, B., Chen, L.-J., Dors, I., Eastwood, J., Forsyth, C., Galvin, A., Genot, V., Halekas, J., Hesse, M., Hine, B., Horbury, T., Jian, L., Kasper, J., Kretzschmar, M., Kunz, M., Lavraud, B., Le Contel, O., Mallet, A., Maruca, B., Matthaeus, W., Niehof, J., O'Brian, H., Owen, C., Retino, A., Reynolds, C., Roberts, O., Schekochihin, A., Skoug, R., Smith, C., Smith, S., Steinberg, J., Stevens, M., Szabo, A., TenBarge, J., Torbert, R., Vasquez, B., Verscharen, D., Whittlesey, P., Wickizer, B., Zank, G., & Zweibel, E. (2023), *arXiv e-prints*, arXiv:2306.06537
340. *The high-speed X-ray camera on AXIS*
Miller, E. D., Bautz, M. W., Grant, C. E., Foster, R. F., LaMarr, B., Malonis, A., Prigozhin, G., Schneider, B., Leitz, C., Herrmann, S., Allen, S. W., Chattopadhyay, T., Orel, P., Morris, R. G., Stueber, H., Falcone, A. D., Ptak, A., & Reynolds, C. (2023), *arXiv e-prints*, arXiv:2309.00717
341. *STROBE-X: X-ray Timing and Spectroscopy on Dynamical Timescales from Microseconds to Years (A Mission White Paper to the Astro2020 US Decadal Survey)*
Ray, P., and the STROBE-X Science Team (2019), *Bulletin of the American Astronomical Society*, 51, 231 (arXiv:1903.03035)
342. *The Advanced X-ray Imaging Satellite (A Mission White Paper to the Astro2020 US Decadal Survey)*
Mushotzky, R., and the AXIS Science Team (2019), *Bulletin of the American Astronomical Society*, 51, 107
343. *A Case for Electron-Astrophysics (ESA-Voyage2050 White Paper)*
Verscharen, D., Wicks, R. T., Alexandrova, O., Bruno, R., Burgess, D., Chen, C. H. K., D'Amicis, R., De Keyser, J., Dudok de Wit, T., Franci, L., He, J., Henri, P., Kasahara, S., Khotyaintsev, Y., Klein, K. G., Lavraud, B., Maruca, B. A., Maksimovic, M., Plaschke, F., Poedts, S., Reynolds, C. S., Roberts, O., Sahraoui, F., Saito, S., Salem, C. S., Saur, J., Servidio, S., Stawarz, J. E., Stverak, S., & Told, D. (2019), *arXiv e-prints*, arXiv:1908.02206
344. *High-Energy Astrophysics in the 2020s and Beyond (A Science White Paper to the Astro2020 US Decadal Survey)*
Reynolds, C.S., Petre, R., Corcoran, M., Arnaud, K., Brandt, N., Lopez, L., Cornish, N., Madsen, K., Gonzales, G., & Brenneman, L. (2019), *Bulletin of the American Astronomical Society*, 51, 385

345. *Supermassive Black Hole Feedback (A Science White Paper to the Astro2020 US Decadal Survey)*
Ruszkowski, M., Nagai, D., Zhuravleva, I., Brummel-Smith, C., Li, Y., Hodges-Kluck, E., Yang, H.-Y. K., Basu, K., Chluba, J., Churazov, E., Donahue, M., Fabian, A., Faucher-Giguère, C.-A., Gaspari, M., Hlavacek-Larrondo, J., McDonald, M., McNamara, B., Nulsen, P., Mroczkowski, T., Mushotzky, R., Reynolds, C., Vikhlinin, A., Voit, M., Werner, N., ZuHone, J., & Zweibel, E. (2019), *Bulletin of the American Astronomical Society*, 51, 326
346. *Probing the Black Hole Engine with Measurements of the Relativistic X-ray Reflection Component (A Science White Paper to the Astro2020 US Decadal Survey)*
Garcia, J., Bachetti, M., Ballantyne, D. R., Brenneman, L., Brightman, M., Connors, R. M., Dauser, T., Fabian, A., Fuerst, F., Gandhi, P., Kamraj, N., Kara, E., Madsen, K., Miller, J. M., Nowak, M., Parker, M. L., Reynolds, C., Steiner, J., Stern, D., Taylor, C., Tomsick, J., Walton, D., Wilms, J., & Zoghbi, A. (2019), *Bulletin of the American Astronomical Society*, 51, 284
347. *The Material Properties of Weakly Collisional, High-Beta Plasmas (A Science White Paper to the Plasma2020 US Decadal Survey)*
Kunz, M. W., Squire, J., Balbus, S. A., Bale, S. D., Chen, C. H. K., Churazov, E., Cowley, S. C., Forest, C. B., Gammie, C. F., Quataert, E., Reynolds, C. S., Schekochihin, A. A., Sironi, L., Spitkovsky, A., Stone, J. M., Zhuravleva, I., & Zweibel, E. G. (2019), *arXiv e-prints*, arXiv:1903.04080
348. *The ASTRO-H (Hitomi) x-ray astronomy satellite*
Takahashi, T., and the Hitomi Science Team (2016), *Space Telescopes and Instrumentation 2016: Ultra-violet to Gamma Ray*, 9905, 99050U
349. *ASTRO-H White Paper - AGN Reflection*
Reynolds, C.S., Ueda, Y., Awaki, H., Gallo, L., Gandhi, P., Haba, Y., Kawamuro, T., LaMassa, S., Lohfink, A., Ricci, C., Tazaki, F., & Zoghbi, A. (2014), *arXiv e-prints*, (arXiv:1412.1177)
350. *ASTRO-H White Paper - AGN Winds*
Kaastra, J. S., Terashima, Y., Kallman, T., Haba, Y., Costantini, E., Gallo, L., Fukazawa, Y., Tombesi, F., Anabuki, N., Awaki, H., Brown, G., di Gesu, L., Ebisawa, K., Ebrero, J., Eckart, M., Hagino, K., Long, K. S., Miller, J., Miyazawa, T., Paltani, S., Reynolds, C., Ricci, C., Sameshima, H., Seta, H., Ueda, Y., & Urry, M. (2014), *arXiv e-prints*, (arXiv:1412.1171)
351. *The ASTRO-H X-ray astronomy satellite*
Takahashi, T. and the Hitomi/Astro-H Science Team, (2014), *Space Telescopes and Instrumentation 2014: Ultraviolet to Gamma Ray*, 9144, 914425
352. *Enduring Quests-Daring Visions (NASA Astrophysics Visionary Roadmap in the Next Three Decades)*
Kouveliotou, C., Agol, E., Batalha, N., Bean, J., Bentz, M., Cornish, N., Dressler, A., Figueroa-Feliciano, E., Gaudi, S., Guyon, O., Hartmann, D., Kalirai, J., Niemack, M., Ozel, F., Reynolds, C., Roberge, A., Straughn, K. S. A., Weinberg, D., & Zmuidzin, J. (2014), *arXiv e-prints*, (arXiv:1401.3741)
353. *The Hot and Energetic Universe: The close environments of supermassive black holes*
Dovciak, M., Matt, G., Bianchi, S., Boller, T., Brenneman, L., Bursa, M., D’Ai, A., di Salvo, T., de Marco, B., Goosmann, R., Karas, V., Iwasawa, K., Kara, E., Miller, J., Miniutti, G., Papadakis, I., Petrucci, P.-O., Ponti, G., Porquet, D., Reynolds, C., Risaliti, G., Rozanska, A., Zampieri, L., Zezas, A., & Young, A. (2013), *arXiv e-prints*, (arXiv:1306.2331)
354. *The Hot and Energetic Universe: A White Paper presenting the science theme motivating the Athena+ mission*
Nandra, K. and the Athena Community, (2013), *arXiv e-prints*, arXiv:1306.2307

355. *LOFT: the Large Observatory For X-ray Timing*

Feroci, M. and the LOFT team, (2012), *Space Telescopes and Instrumentation 2012: Ultraviolet to Gamma Ray*, 8443, 84432D

356. *The ASTRO-H X-ray Observatory*

Takahashi, T., and the Hitomi/Astro-H team (2012), *Space Telescopes and Instrumentation 2012: Ultraviolet to Gamma Ray*, 8443, 84431Z

Talk List for Christopher S. Reynolds

Invited Talks at International (non-US) Conferences/Workshops

1. *The inner accretion disk in M87*, 19th September 1997, invited talk at “The M87 Ringberg workshop”, Ringberg, Germany.
2. *Compton reflection and iron fluorescence in AGN and GBHCs*, 30th June 1998, invited review talk at the meeting on “High-energy processes in accreting black holes”, Graftavallen, Sweden.
3. *Probing strong gravity with future X-ray missions*, 9th September 1999, invited presentation at the “X-ray Astronomy 1999” meeting in Bologna, Italy.
4. *X-ray probes of black hole accretion disks*, 11th July 2002, invited talk at the meeting on “Making Light of Gravity” (in honour of Professor Sir Martin Rees’s 60th birthday), Institute of Astronomy, Cambridge, United Kingdom.
5. *Broad Iron Lines in AGN*, 24th July 2003, invited review talk at the 10th Marcel Grossman Meeting on General Relativity, Rio de Janeiro, Brazil.
6. *Spectra and spectral variability of accretion disks in AGN*, 25th July 2003, invited review talk at the 10th Marcel Grossman Meeting on General Relativity, Rio de Janeiro, Brazil.
7. *Black Hole Spin in AGN and GBHBs*, 12th July 2004, invited talk at the workshop on “From X-ray Binaries to Quasars: Black Hole Accretion Across All Mass Scales”, Amsterdam, Netherlands
8. *Accretion Processes in AGN*, 28th March 2005, invited review talk at the “Triggering Relativistic Jets” conference, Cozumel, Mexico.
9. *Constraining black hole spin with iron line spectroscopy*, 30th November 2006, invited talk at the “Active Galactic Nuclei and Black Holes” workshop, TIARA, Hsinchu, Taiwan.
10. *Assessing models of high-frequency quasi-periodic oscillations*, 19th December 2007, invited talk at the international workshop on “Measuring the Mass and Spin of Black Holes”, Pune, India.
11. *X-ray diagnostics of Black Hole Spin*, 24th July 2008, invited review talk at the conference “Putting Gravity to Work: Black Holes to Galaxy Clusters”, Institute of Astronomy, University of Cambridge, Cambridge, UK
12. *The temporal variability of geometrically-thin accretion disks*, 16th April 2009, invited review talk at the workshop “Astrophysics of the MRI and related processes”, Ringberg Castle, Germany
13. *Physical conditions close to accreting black holes*, 28th October 2009, invited review talk at the conference "High Energy Processes in Relativistic Outflows II", Buenos Aires, Argentina.
14. *Future probes of strong gravity using X-ray spectroscopy*, 17th February 2010, invited review talk at the conference on "Probing Strong Gravity Near Black Holes", Prague, Czech Republic
15. *A Suzaku survey of spin and relativistic physics in AGN*, 26th February 2010, invited talk at the "Suzaku Key Projects Workshop", ISAS, Tokyo, Japan

16. *Spectral features in compact objects*, 20th July 2010, invited talk at the session on “Probing Strong Gravity with Gravitational and Electromagnetic Waves” within the “38th COSPAR meeting”, Bremen, Germany
17. *Compact object tests of General Relativity*, 20th July 2010, invited talk at the session on “Accretion on Compact Objects and Fast Phenomena in Multiwave-length Era” within the “38th COSPAR meeting”, Bremen, Germany
18. *MHD instabilities and conduction in the ICM*, 24th July 2010, invited talk at the session on “Cosmic Feedback” within the “38th COSPAR meeting”, Bremen, Germany
19. *AGN and Strong Gravity*, 25th October 2010, invited review talk at the GRAVITAS Science Workshop, MPE, Garching, Germany
20. *Iron line probes of strong gravity and relativistic astrophysics with IXO*, 15th March 2011, invited review talk at the IXO Science Meeting, Rome, Italy
21. *Accretion Disks: Simulations and Observations*, 23rd May 2011, invited review talk at the conference “Relativistic jets”, Krakow, Poland
22. *Black Hole Spin from Iron Line Spectroscopy*, 10th Oct 2012, invited review at the workshop “The physics of black hole accretion” in Bern, Switzerland.
23. *Supermassive Black Hole Spin : The X-ray View*, 22nd May 2014, invited review talk at the conference “99 years of black holes”, Potsdam, Germany.
24. *Relativistic Astrophysics in Active Galactic Nuclei*, 18th June 2014, invited plenary review talk at the “X-ray Universe 2014 meeting”, Dublin, Ireland.
25. *The physics of the intracluster medium and AGN feedback*, 15th July 2014, invited review talk at the “From the MRI to the Sun” meeting, Chamonix, France
26. *Magnetic models of black hole state transitions*, 10th April 2015, invited talk at the RAS meeting on black hole accretion, London, UK
27. *Disk-jet-spin connection in active galactic nuclei*, 20th April 2015, invited review talk at the conference “Relativistic Jets: Creation, Dynamics and Internal Physics”, Krakow, Poland
28. *Unwrapping the X-ray spectra of active galactic nuclei*, 8th June 2015, invited review talk at “The Extremes of Black Hole Accretion”, ESAC, Spain
29. *Reverberation from Super-Eddington Tidal Disruption Events*, 3rd February, invited talk at the workshop “The X-ray Spectral-Timing Revolution”, Lorenz Center, Leiden, Netherlands
30. *Decoding the Variability of Accreting Black Holes*, 10th July 2016, invited talk at “Simulations and Modeling of Relativistic MHD Accretion Disk”, Oxford, UK
31. *Super-critical Accretion in AGN and Quasars*, 20th September 2016, invited review at the “Breaking the Limits: Super-Eddington Accretion onto Compact Objects” conference, Arbatax, Sardinia, Italy.
32. *An X-ray view of the active galactic nucleus in NGC1275*, 17th May 2018, invited talk at the conference “Perseus in Sicily”, Sicily, Italy
33. *Macro- and Micro-Physics of Thermal Conduction in Clusters of Galaxies*, 12th July 2018, invited talk at the conference “Multiphase AGN Feeding and Feedback”, Sesto, Italy

34. *AGN Feedback in Clusters :Theoretical Perspective*, 6th September 2018, invited talk at the conference “Thinkshop2018: The Role of Feedback in Galaxy Formation”, Potsdam, Germany
35. *New Constraints on ALPs from Deep Chandra Grating Observation of NGC1275*, 25th October 2018, invited talk at the Royal Society workshop “X-ray astronomy and fundamental physics”, Chicheley Hall, United Kingdom
36. *Influence of accretion disk physics on relativistic reflection spectra*, 6th May 2019, invited talk at the “Athena Community Workshop”, Mullard Space Science Laboratory, United Kingdom
37. *The Lynx X-ray Observatory*, 15th July 2019, invited conference talk at “XCalibur2019; Next-gen X-ray spectroscopy”, Winchester, United Kingdom
38. *Clusters of galaxies as particle physics laboratories*, 5th September 2019, invited talk at the conference “Recent Progress in Relativistic Astrophysics”, Fudan, Shanghai, China
39. *Supermassive black holes as a probe of relativistic astrophysics*, 16th December 2019, invited plenary talk at the “Texas Symposium on Relativistic Astrophysics”, Portsmouth, United Kingdom
40. *Simulations of Accretion Disks*, 29th January 2021, invited review at the COSPAR meeting, Sydney Australia (talk given remotely)
41. *Observational Constraints on Black Hole Spin (review)*, 30th January 2021, invited review at the COSPAR meeting, Sydney Australia (talk given remotely)
42. *Whistler-Regulated MHD: The Physics of Thermal Conduction in the ICM*, 21st June 2022, invited talk at the conference “Multiphase AGN Feeding and Feedback II”, Sesto, Italy
43. *Disconnects in accretion disk physics: theoretical challenges*, 23rd January 2023, invited review talk at the Lorentz Center Workshop on “Overcoming disconnects in understanding of accreting black holes”, Leiden, Netherlands

Invited Talks at Domestic (US hosted) Conferences

44. *The X-ray properties of Cygnus-A*, 3rd May 1995, invited talk at the “Cygnus A - Study of a Radio Galaxy” workshop, Greenbank, West Virginia.
45. *Warm absorbers in Seyfert 1 galaxies*, 20th February 1997, invited talk at the “Mass ejection from AGN” workshop, Pasadena, California.
46. *X-ray iron line variability: constraints on the inner accretion disk*, 21st June 2000, invited talk at the workshop on “Probing the Physics of Active Galactic Nuclei by Multiwavelength Monitoring”, NASA Goddard Space Flight Center, Greenbelt, Maryland.
47. *X-ray iron line constraints on the inner accretion disk and black hole spin*, 5th June 2000, invited talk at the summer meeting of the *American Astronomical Society*, Rochester, New York.
48. *MHD simulations of the inner regions of black hole accretion disks*, 13th December 2000, invited parallel-session talk at the 20th Texas Symposium, Austin, Texas.
49. *Iron line diagnostics of active galactic nuclei*, June 2001, invited talk at the workshop on “X-ray emission from accreting black holes”, Johns Hopkins University, Baltimore, Maryland.

50. *Magnetic torques in accretion disks*, February 2002, invited talk at the workshop on “Black Holes: Theory confronts Reality 3 years later”, Institute for Theoretical Physics, Santa Barbara, California.
51. *X-ray diagnostics of black holes*, invited plenary talk at the SPIE meeting, 26th August 2002, Waikoloa, Hawaii
52. *Recent X-ray studies of AGN*, invited review at the COSPAR meeting, 10th October 2002, Houston TX
53. *New Directions in Black Hole Astrophysics*, 8th January 2003, invited parallel-session review talk at the 201st meeting of the American Astronomical Society, Washington DC.
54. *Spectra of Accretion Disks in AGN and GBHCs*, 5th May 2003, invited review talk at the “Science with Constellation-X” meeting, Columbia University, New York City.
55. *Probing Spacetime Structure Near Black Holes*, 6th June 2003, invited presentation at the National Academy of Science’s German-American Frontiers of Science meeting, Irvine, California.
56. *Prospects for probing AGN physics with future X-ray Timing Observations*, 4th November 2003, invited talk at the “X-ray Timing 2003” meeting, Cambridge, MA.
57. *Black Hole Astrophysics*, 14th May 2004, invited review talk at the “Beyond Einstein” conference, SLAC, Stanford University, California.
58. *Black Hole Accretion Disk Coronae: An X-ray View*, 1st June 2004, invited review talk at the 204th meeting of the American Astronomical Society, Denver, Colorado.
59. *Extreme Gravity Near Black Holes and Neutron Stars*, 9th January 2006, invited parallel session talk at the 207th meeting of the American Astronomical Society, Washington DC
60. *Black Hole Astrophysics in the New Century*, 12th January 2006, Warner Prize lecture at the 207th meeting of the American Astronomical Society, Washington DC
61. *Black Holes*, 2nd June 2006, invited panelist and presenter at the Hans Bethe Centennial Meeting, Ithaca, NY
62. *Black Hole Astrophysics in the New Century*, 14th July 2006, invited talk at the “Supermassive Black Holes 2006” meeting, Santa Fe, NM.
63. *Future X-ray studies of black holes*, 6th October 2006, invited special session talk at the AAS-HEAD meeting, San Francisco, CA.
64. *The Magnetic Universe*, 18th January 2007, invited talk at the “Second Indo-US Frontiers of Science” Meeting, Irvine, CA.
65. *Black Holes : Close to the Event Horizon*, 10th December 2007, invited review talk at the “Suzaku 2007” conference, San Diego, CA (10–12th December 2007)
66. *Black Hole Physics with Constellation-X*, 9th July 2008, invited talk at the conference “Quarks to Cosmos 3: Fundamental Physics in Space”, Airlie Center, Warrenton, VA
67. *The Suzaku View of X-ray Binaries*, 10th September 2008, invited review talk at the conference “Three years of Science with Suzaku”, Johns Hopkins University, Baltimore, MD

68. *Are X-shaped Radio Galaxies Really Merger Induced Spin-Flips?*, 1st April 2009, invited talk at the “Observational Signatures of Supermassive Black Hole Mergers”, Space Telescope Science Institute, Baltimore, MD
69. *X-ray Signatures of Strong Gravity*, 25th August 2009, invited talk at the workshop on “Matter and electromagnetic fields in strong gravity”, University of Maryland, College Park, MD
70. *The Suzaku AGN Spin Survey*, 20th July 2011, invited review talk at the conference “Suzaku 2011 : Exploring the X-ray Universe and Beyond”, Stanford/SLAC, CA
71. *Accretion Disks: Theory and Observations*, 25th October 2011, keynote talk at the “Einstein Fellows Symposium”, NASA-Goddard, Greenbelt, MD.
72. *Accretion Disk Physics*, 4th November 2011, invited review talk at the JSI Minisymposium on "Accretion and Particle Acceleration", NASA-Goddard, Greenbelt, MD.
73. *Observational overview of accretion onto compact objects*, 17th February 2012, invited review talk at the JSI Minisymposium on "Accretion Astrophysics", UMCP, MD.
74. *The physics of the intracluster medium: MHD instabilities, cooling flows and filaments*, 29th Aug 2012, invited talk at the “2nd ICM-Theory Workshop”, Ann Arbor, Michigan
75. *Disks, jets and spin in active galactic nuclei*, 9th April 2013, invited talk in a special session at the 2013 meeting of the High Energy Astrophysics Division (HEAD) of the American Astronomical Society (AAS), Monterey, CA
76. *The temporal variability of accretion disks*, 9th August 2013, invited talk at the KITP Conference “Massive black holes: birth, growth and impact”, KITP/Santa Barbara, CA.
77. *The spin of supermassive black holes*, 21st Nov 2013, invited talk at the "Astro-GR conference", Georgia Tech, Atlanta, GA.
78. *Observing black hole spin*, 7th August 2015, IAU Div-D meeting, Honolulu, HI
79. *Plasmas and High-Energy Astrophysics - A Brief Tour*, 11th May 2016, invited talk at 11th International Conference on High Energy Density Laboratory Astrophysics, SLAC National Accelerator Laboratory, Menlo Park, California.
80. *AGN Feedback in Galaxy Clusters in the Post Hitomi Era*, invited review at the 14th October 2016, Mid-Atlantic Radio-Loud AGN Meeting (MARLAM), Johns Hopkins University, MD
81. *Towards a First Principles Understanding of Black Hole Variability*, 10th February 2017, invited talk at “Disks, Dynamos and Data” conference at the Kavli Institute of Theoretical Physics, Santa Barbara, CA
82. *The impact of Chandra on Black Hole Astrophysics*, 18th March 2019, invited review at the “17th Divisional meeting of the High-Energy Astrophysics Division of the American Astronomical Society”, Monterey CA
83. *Relativistic Reverberation Mapping with XMM-Newton: Achievements and Perspectives*, 20th March 2019, invited review at the “17th Divisional meeting of the High-Energy Astrophysics Division of the American Astronomical Society”, Monterey CA
84. *Whistler Suppression of Heat Flux in the Intracluster Medium*, 3rd October 2022, invited conference talk at “Multiscale Plasma Astrophysics”, KITP, Santa Barbara, CA

85. *Accreting black holes: What do we learn from X-ray Spectra?*, 8th August 2022, invited talk at the workshop “Black Hole Accretion in Charleston”, Charleston, SC
86. *Accretion Disk Simulations*, 11th August 2022, invited talk at the workshop “Black Hole Accretion in Charleston”, Charleston, SC
87. *The Advanced X-ray Imaging Satellite (AXIS)*, 8th January 2023, invited splinter session talk at the winter meeting of the American Astronomical Society
88. *The Advanced X-ray Imaging Satellite (AXIS)*, 11th January 2023, invited special session talk at the winter meeting of the American Astronomical Society
89. *The Advanced X-ray Imaging Satellite (AXIS)*, 26th March 2023, invited special session talk at the “Divisional Meeting of the High-Energy Astrophysics Division of the American Astronomical Society”, Waikaloa, HI
90. *AXIS and Impact on Neutron Star Studies*, 26th October 2023, invited workshop talk at “UMD Neutron Stars Workshop”, College Park, MD
91. *Variability and magnetic field growth in models of black hole accretion*, 23rd February 2024, invited conference talk at “Turbulence in the Universe”, Kavli Institute for Theoretical Physics, Santa Barbara

International (non-US) Colloquia

92. *Black Hole Astrophysics in the New Century*, 16th December 2004, invited seminar to the Astrophysics Group at Leicester University, UK
93. *Constraining black hole spin using X-ray Spectroscopy*, 6th November 2007, invited colloquium at the Indian Institute for Astrophysics, Bangalore, India
94. *Constraining black hole spin using X-ray Spectroscopy*, 7th November 2007, invited colloquium at the Raman Research Institute, Bangalore, India
95. *The temporal variability of black hole accretion*, 26th March 2008, invited seminar at the Ecole Normale Supérieure de Paris, Paris, France.
96. *The temporal variability of black hole accretion*, 1st May 2008, invited colloquium at the Institute of Astronomy, University of Cambridge, Cambridge, UK.
97. *Measuring black hole spin with X-ray spectroscopy*, 27th October 2008, invited colloquium at Canadian Institute for Theoretical Astrophysics (CITA), Toronto, Canada.
98. *New Insights into Black Hole Accretion*, 7th June 2010, Max-Planck Institut für Astrophysik, Garching, Germany
99. *New Insights into Black Hole Accretion*, 25th June 2010, IAP, Paris, France
100. *The astrophysics of black hole spin*, 20th June 2012, invited talk (Biermann Lecture part-I) at the Max Planck Institut für Astrophysik, Garching, Germany
101. *The physics of accretion disks : what lies beyond viscous disk theory?*, 27th June 2012, invited talk (Biermann Lecture part-II) at the Max Planck Institut für Astrophysik, Garching, Germany

102. *Booms, flashes and echoes : new probes of relativistic physics*, 11th July 2012, invited talk (Biermann Lecture part-III) at the Max Planck Institut für Astrophysik, Garching, Germany
103. *The physics of accretion disks : what lies beyond viscous disk theory?*, 19th July 2012, invited talk at Bamberg Observatory, Bamberg, Germany
104. *The physics of the intracluster medium: MHD instabilities, cooling flows and filaments*, 20th July 2012, invited seminar to the high-energy astrophysics group at the Max Planck Institut für Astrophysik, Garching, Germany
105. *The physics of accretion disks : what lies beyond viscous disk theory?*, 25th Sept 2012, invited colloquium at the Herzberg Institute, Victoria, BC, Canada.
106. *The astrophysics of black hole spin*, 26th Sept 2012, invited colloquium at the University of Victoria, BC, Canada.
107. *The astrophysics of black hole spin*, 14th June 2013, invited Prize Lecture at National Central University, Jhongli, Taiwan.
108. *The role of black holes in galaxy formation*, 22nd October 2013, Hintze Lecture, Dept. of Physics, Oxford University, Oxford, UK
109. *Relativistic Astrophysics in Active Galactic Nuclei*, 3rd November 2014, invited Astrophysics Colloquium, Dept of Physics, University of Oxford.
110. *Relativistic Astrophysics in Active Galactic Nuclei*, 6th November 2014, invited Astrophysics Colloquium, Dept of Physics, University of Bristol.
111. *Relativistic Astrophysics in Active Galactic Nuclei*, 10th December 2014, invited colloquium, IST, Lisbon, Portugal.
112. *The physics of the intracluster medium and AGN feedback*, 11th December 2014, invited astrophysics talk, Dept of Physics, University of Oxford.
113. *The physics of the intracluster medium and AGN feedback*, 26th February 2015, invited colloquium, Institute of Astronomy, University of Cambridge, UK
114. *The physics of the intracluster medium and AGN feedback*, 7th May 2015, invited astronomy colloquium, Leiden, Netherlands
115. *The physics of the intracluster medium and AGN feedback*, 13th May 2015, invited colloquium, Dept of Physics, University of Southampton, UK
116. *The variability of accreting black holes*, 21st January 2016, invited colloquium, Institute of Astronomy, University of Cambridge, UK
117. *Booms, Rumbles & Whistles in the Night : Diving into the Physics of AGN Feedback in Galaxy Clusters*, 18 February 2018, invited astrophysics colloquium at University of Oxford, Oxford, UK
118. *The observable consequences of dynamos in black hole accretion disks*, 28th February 2018, invited astrophysical fluids seminar at the Department of Applied Math and Theoretical Physics, University of Cambridge, Cambridge, UK
119. *Booms, Rumbles & Whistles in the Night : Diving into the Physics of AGN Feedback in Galaxy Clusters*, 28th February 2018, invited physics colloquium at Durham University, Durham, UK

120. *Why do AGN vary?*, 9th May 2019, invited colloquium at Shanghai Observatory, Shanghai, China
121. *Particle Physics Beyond the Standard Model with Galaxy Clusters*, 9th January 2020, invited joint MPA-ESO colloquium, Garching Germany
122. *Particle Physics Beyond the Standard Model with Galaxy Clusters*, 1st April 2020, invited seminar at the Lund Observatory, Sweden (talk given via zoom)
123. *Particle Physics Beyond the Standard Model with Galaxy Clusters*, 17th April 2020, invited seminar at CNRS Toulouse, France (talk given via zoom)
124. *Particle Physics Beyond the Standard Model with Galaxy Clusters*, 23rd April 2020, invited colloquium at the Institute of Astronomy, Cambridge, UK (talk given via zoom)
125. *Particle Physics Beyond the Standard Model with Galaxy Clusters*, 27th August 2020, invited colloquium at the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India (talk given via zoom)
126. *Booms, Rumbles & Whistles in the Night : Diving into the Physics of AGN Feedback in Galaxy Clusters*, 14th April 2021, invited colloquium at the University of Amsterdam, Amsterdam, Netherlands (talk given via zoom)
127. *Particle Physics Beyond the Standard Model with Galaxy Clusters*, 7th May 2021, invited colloquium at Sussex University, Sussex, UK (talk given via zoom)
128. *Why Do Accreting Black Holes Vary?*, 26th May 2021, invited colloquium at National Central University Taiwan as part of the “NCU-Delta Young Astronomer Alumni Event” (talk given via zoom)
129. *Why do AGN vary?*, 21 July 2021, invited colloquium to the Indian Institute of Astrophysics, Bangalore, India (talk given on zoom)
130. *Thermal Conduction in Intracluster Medium*, 1st September 2021, invited seminar to the UNAM Plasma Physics Group, Mexico City, Mexico (talk given on zoom)
131. *Searching for Axion-Like Particles through X-ray Studies of Galaxy Clusters*, 24 November 2021, invited seminar to the University of Nottingham Astronomy Group, Nottingham, UK
132. *The Physics of AGN Feedback in Galaxy Clusters: booms, bangs, and whistles.*, 2nd February 2023, invited colloquium at the Institute of Astronomy, Cambridge, UK
133. *Searching for Axion-Like Particles with X-ray studies of Galaxy Clusters*, 8th February 2023, invited physics/astronomy colloquium at the University of Hertsfordshire, UK

Domestic (US) Colloquia

134. *Probing supermassive black holes with X-ray spectroscopy*, 11th September 1997, invited colloquium at JILA, University of Colorado, Boulder, Colorado.
135. *Probing supermassive black holes with X-ray spectroscopy*, 13th November 1997, invited colloquium at University of Kentucky, Lexington, Kentucky.
136. *Probing supermassive black holes with X-ray spectroscopy*, 8th December 1997, invited seminar to the Space Telescope Science Institute, Baltimore, Maryland.

137. *Reverberation mapping of black hole accretion disks*, 16th September 1998, invited seminar to JILA, University of Colorado, Boulder, Colorado.
138. *X-ray spectroscopic probes of the inner regions of AGN*, 13th November 1998, invited colloquium to the Astronomy Department at Columbia University, New York City.
139. *Probing supermassive black holes with X-ray spectroscopy*, 1st April 1999, invited colloquium to the Physics and Astronomy Department at Johns Hopkins University, Baltimore, Maryland.
140. *Probing supermassive black holes with X-ray spectroscopy*, 7th April 1999, invited colloquium to the Astronomy Department at Penn State University, State College, Pennsylvania.
141. *X-ray studies of AGN – closing in on massive black holes*, 2nd February 2000, invited colloquium to Astronomy department at the California Institute of Technology, Pasadena, California.
142. *X-ray studies of AGN – closing in on massive black holes*, 31st March 2000, invited colloquium to Astronomy department at the University of Nevada at Las Vegas.
143. *X-ray studies of AGN – closing in on massive black holes*, 9th May 2000, invited colloquium to the Center for Space Research at the Massachusetts Institute of Technology, Cambridge, Massachusetts.
144. *Evolution of powerful radio galaxies*, February 2001, invited colloquium given to Space Telescope Science Institute, Baltimore, Maryland.
145. *X-ray probes of supermassive black holes*, February 2001, invited colloquium given to Astronomy Department at Harvard University, Cambridge Massachusetts.
146. *X-ray probes of supermassive black holes*, February 2001, invited colloquium given to the Astronomy Department at University of California Berkeley.
147. *X-ray probes of supermassive black holes*, March 2001, invited colloquium given to the Physics Department at University of California at Santa Barbara, Santa Barbara, California.
148. *XMM-Newton/EPIC observations of MCG-6-30-15: evidence for the extraction of spin energy from a black hole*, 20th November 2001, invited seminar to the Laboratory for High Energy Astrophysics at NASA Goddard Space Flight Center, Greenbelt, Maryland.
149. *X-ray bubbles and shells associated with radio galaxies*, 25th January 2002, invited colloquium given at the VLA-AOC Socorro, New Mexico.
150. *The spinning black hole in MCG-6-30-15*, 11th February 2002, invited seminar to the AGN journal club at the Space Telescope Science Institute, Baltimore, Maryland.
151. *The spinning black hole in MCG-6-30-15*, 24th April 2002, invited seminar to the Astrophysics Theory Group at the University of Illinois, Champaign, Illinois.
152. *X-ray observations of black holes and black hole accretion disks*, 21st October 2002, invited colloquium to the Astronomy Department at the University of Virginia, Charlottesville, VA.
153. *X-ray Observations of Relativistic Gravity and Black Hole Spin*, 1st April 2004, invited colloquium to the Astronomy Department, Yale University, New Haven CT.
154. *X-ray Observations of Relativistic Gravity and Black Hole Spin*, 27th September 2004, invited colloquium to the Department of Physics, University of Rochester, Rochester, New York.

155. *Relativistic X-ray iron lines: a window on horizon scale astrophysics in accreting black hole systems*, 7th June 2005, invited colloquium to the participants of the Astrophysical Disks and Jets Program at the Kalvi Institute for Theoretical Physics, Santa Barbara, CA.
156. *How rapidly can black hole spin energy be extracted?*, October 2005, invited seminar to the Center for Space Research at MIT, Cambridge, MA.
157. *MHD and Black Hole Astrophysics*, October 2005, invited colloquium at the High Altitude Observatory, Boulder, CO.
158. *AGN Feedback in the Core Regions of Galaxy Clusters*, 8th March 2006, invited astrophysics colloquium at Columbia University, New York City.
159. *AGN Feedback in the Core Regions of Galaxy Clusters*, 16th March 2006, invited astrophysics colloquium at Johns Hopkins University, Baltimore, MD.
160. *AGN Feedback in the Core Regions of Galaxy Clusters*, 31st March 2006, invited astrophysics colloquium at University of Minnesota, Minneapolis, MN
161. *AGN Feedback in the Core Regions of Galaxy Clusters*, 26th April 2006, invited colloquium at Caltech, Pasadena, CA.
162. *Towards a measure of black hole spin*, 16th April 2007, invited colloquium at the University of Virginia, Charlottesville, VA.
163. *Towards a measure of black hole spin*, May 2007, invited colloquium at the University of Maryland, College Park, MD.
164. *The temporal variability of accretion onto black holes*, 22nd August 2007, invited seminar at KIPAC/Department of Physics, Stanford University, Palo Alto, CA
165. *The temporal variability of black hole accretion*, 25th June 2008, invited seminar at JILA, University of Colorado, Boulder, CO.
166. *Measuring black hole spin with X-ray spectroscopy*, 24th March 2009, invited colloquium to the Astrophysical Sciences Department, Princeton, NJ.
167. *The role of AGN in clusters of galaxies*, 7th April 2009, invited astrophysics seminar at the Institute for Advanced Study, Princeton, NJ
168. *Matter flows around merging black holes*, 17th September 2009, invited seminar at the ITC luncheon, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA.
169. *The subtle physics of black hole accretion*, 17th September 2009, invited colloquium at the Harvard-Smithsonian Center for Astrophysics, Cambridge, MA.
170. *The subtle physics of black hole accretion*, 17th November 2009, invited colloquium at the Department of Astronomy, University of Wisconsin, Madison, WI.
171. *The subtle physics of black hole accretion*, 31st March 2010, invited colloquium at the Department of Physics and Astronomy, University of Pennsylvania, Philadelphia, WI.
172. *The subtle physics of black hole accretion*, 15th April 2010, invited colloquium at the Department of Physics, LSU, Baton Rouge, LA.

173. *New insights into black hole accretion*, 20th September 2010, invited Astronomy colloquium at the University of Colorado, Boulder, CO
174. *New insights into black hole accretion*, 21st October 2010, invited Astronomy colloquium at the University of Michigan, Ann Arbor, MI
175. *New insights into black hole accretion*, 5th November 2010, invited Astronomy colloquium at the University of Minnesota, Minneapolis, MN
176. *How do black holes grow?*, 29th March 2012, invited Physics and Astronomy Colloquium at Dickinson College, Carlisle, PA.
177. *The astrophysics of black hole spin : The Suzaku AGN Spin Survey*, 11th April 2012, invited Physics and Astronomy Colloquium at Rutgers University, NJ
178. *The astrophysics of black hole spin : The Suzaku AGN Spin Survey*, 13th April 2012, invited Physics and Astronomy Colloquium at New York University, NY
179. *The astrophysics of black hole spin*, 13th March 2013, invited Astronomy Colloquium at UC Santa Cruz, CA.
180. *The astrophysics of black hole spin*, 22nd April 2013, invited Physics Colloquium at Georgia Tech, Atlanta, GA.
181. *Up Close and Personal with Supermassive Black Holes*, invited colloquium, Dept of Astrophysical Sciences, Princeton University, Princeton, NJ.
182. *The astrophysics of black hole spin*, 6th December 2013, invited Physics Colloquium at University of Kentucky, Lexington, KY.
183. *Up Close and Personal with Supermassive Black Holes*, 4th February 2014, invited colloquium, Dept of Astrophysical Sciences, Princeton University, Princeton, NJ
184. *Up Close and Personal with Supermassive Black Holes*, 26th March 2014, invited colloquium, Dept of Astronomy, Penn State University, State College, PA
185. *Relativistic Astrophysics in Active Galactic Nuclei*, 1st May 2014, invited astrophysics colloquium, Dept. of Physics / KIPAC, Stanford University, Palo Alto, CA
186. *A new spin on black holes*, 9th May 2014, Goddard Scientific Colloquium, NASA- Goddard, Greenbelt, MD.
187. *Relativistic astrophysics in active galactic nuclei*, 3rd November 2015, invited astrophysics colloquium at MIT
188. *The variability of accreting black holes*, 22nd April 2016, invited astrophysics colloquium at Virginia Tech, Blacksburg, VA
189. *Particle Physics Beyond the Standard Model with Galaxy Clusters*, 1st October 2019, invited physics colloquium at the University of California Santa Barbara, Santa Barbara, CA
190. *Booms, Fizzles & Whistles : The Physics of AGN Feedback in Galaxy Clusters*, 31st March 2021, invited astrophysics seminar, University of Kentucky, Lexington KY.

191. *Thermal Conduction in Intracluster Medium*, 17th June 2021, JPP Frontiers of Plasma Physics Colloquium, Princeton (online)
192. *Probing the Extremes with Clusters of Galaxies*, 16th February 2022, invited astronomy colloquium at the University of Maryland, College Park, MD
193. *Searching for Axion-Like Particles with X-ray studies of Galaxy Clusters*, 29th March 2022, invited joint Princeton University/Institute of Advanced Study colloquium, Princeton, NJ
194. *Exploring the Axion-Sector with X-ray Astronomy*, 27th March 2024, McDonnell Distinguished Lecture, Washington University, St. Louis, MO

Popular/Public Talks (selected)

195. *The What, How, Where and When of Supermassive Black Holes*, 28th March 2024, McDonnell Distinguished Public Lecture, Washington University, St. Louis, MO