

CURRICULUM VITAE

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I. Personal

Date of Birth: April 30 1961

Nationality: American

II. Education

BSc with First Class Honours in Astrophysics, Queen Mary College, University of London, England, awarded August 1 1983.

MPhil in Physics, with a mark of 30/30 cum laude, International School for Advanced Studies, Trieste, Italy, awarded October 16 1985.

DPhil in Physics, International School for Advanced Studies, Trieste, Italy, awarded September 10 1986. Thesis Title: *The Stability of Thick Accretion Disks*. Supervisor: Marek A. Abramowicz.

III. Employment

October 1 1986 to September 30 1989: Chaim Weizmann Research Fellow in Theoretical Physics at the California Institute of Technology.

October 12 1989 to August 31 1993: Research Associate at the Canadian Institute for Theoretical Astrophysics, University of Toronto.

September 1 1993 to May 31 1998: Assistant Professor at the Department of Physics, University of California, Santa Barbara.

June 1 1998 to June 30 2004: Associate Professor at the Department of Physics, University of California, Santa Barbara

July 1 2004 to present: Professor at the Department of Physics, University of California, Santa Barbara

Vice-Chair of the UCSB Physics Department, July 1, 2008-June 30, 2010

IV. Publications

(a) *Articles in refereed journals*

- Henisey, K. B., Blaes, O., & Fragile, P. C. 2012. *Variability from Nonaxisymmetric Fluctuations Interacting with Standing Shocks in Tilted Black Hole Accretion Disks*, ApJ, 761, 18.
- Done, C., Davis, S., Jin, C., **Blaes, O.**, & Ward, M. 2012. *Intrinsic disc emission and the Soft X-ray Excess in AGN*, MNRAS, 420, 1848-1860.
- Tao, T., & **Blaes, O.** 2011. *Local Radiation MHD Instabilities in Magnetically Stratified Media*, ApJ, 742, 8 (14pp).
- Blaes, O.**, Krolik, J. H., Hirose, S., & Shabaltas, N. 2011. *Dissipation and Vertical Energy Transport in Radiation-Dominated Accretion Disks*, ApJ, 733, 110 (24pp).
- Henisey, K. B., **Blaes, O. M.**, Fragile, P. C., & Ferreira, B. T. 2009. *Excitation of Trapped Waves in Simulations of Tilted Black Hole Accretion Disks with Magnetorotational Turbulence*, ApJ, 706, 705-711.
- Hirose, S., **Blaes, O.**, & Krolik, J. H. 2009. *Turbulent Stresses in Local Simulations of Radiation-Dominated Accretion Disks, and the Possibility of the Lightman-Eardley Instability*, ApJ, 704, 781-788.
- Davis, S. W., **Blaes, O. M.**, Hirose, S., & Krolik, J. H. 2009. *The Effects of Magnetic Fields and Inhomogeneities on Accretion Disk Spectra and Polarization*, ApJ, 703, 569-584.
- Hirose, S., Krolik, J. H., & **Blaes, O.** 2009. *Radiation-Dominated Disks are Thermally Stable*, ApJ, 691, 16-31.
- Fragile, P. C., & **Blaes, O. M.** 2008. *Epicyclic Motions and Standing Shocks in Numerically Simulated Tilted Black-Hole Accretion Disks*, ApJ, 687, 757-766.
- Kishimoto, M., Antonucci, R., **Blaes, O.**, Lawrence, A., Boisson, C., Albrecht, M., & Leipski, C. 2008. *The characteristic blue spectra of accretion disks in quasars as uncovered in the infrared*, Nature, 454, 492-494.
- Davis, S. W., Woo, J.-H., & **Blaes, O. M.** 2007. *The UV Continuum of Quasars: Models and SDSS Spectral Slopes*, ApJ, 668, 682-698.
- Fragile, P. C., **Blaes, O. M.**, Anninos, P., & Salmonson, J. D. 2007. *Global General Relativistic Magnetohydrodynamic Simulation of a Tilted Black-Hole Accretion Disk*, ApJ, 668, 417-429.
- Blaes, O. M.**, Šrámková, E., Abramowicz, M. A., Kluźniak, W., & Torkelsson, U. 2007. *Epicyclic Oscillations of Fluid Bodies: Newtonian Nonslender Torus*, ApJ, 665, 642-653.

- Blaes, O.**, Hirose, S., & Krolik, J. H. 2007. *Surface Structure in an Accretion Disk Annulus with Comparable Radiation and Gas Pressure*, ApJ, 664, 1057-1071.
- Krolik, J. H., Hirose, S., & **Blaes, O.** 2007. *Thermodynamics of an Accretion Disk Annulus with Comparable Radiation and Gas Pressure*, ApJ, 664, 1045-1056.
- Davis, S. W., Done, C., & **Blaes, O. M.** 2006. *Testing Accretion Disk Theory in Black Hole X-ray Binaries*, ApJ, 647, 525-538.
- Arras, P., **Blaes, O.**, & Turner, N. J. 2006. *Quasi-Periodic Oscillations from Magnetorotational Turbulence*, ApJ, 645, L65-L68.
- Blaes, O. M.**, Davis, S. W., Hirose, S., Krolik, J. H., & Stone, J. M. 2006. *Magnetic pressure support and accretion disk spectra*, ApJ, 645, 1402-1407.
- Blaes, O. M.**, Arras, P., & Fragile, P. C. 2006. *Oscillation modes of relativistic slender tori*, MNRAS, 369, 1235-1252.
- Abramowicz, M. A., **Blaes, O. M.**, Horák, J., Kluźniak, W., & Rebusco, P. 2006. *Epicyclic oscillations of fluid bodies: II. Strong Gravity*, Class. Quantum Grav., 23, 1689-1696.
- Kishimoto, M., Antonucci, R., & **Blaes, O.** 2005. *The dust-eliminated shape of quasar spectra in the near-infrared: a hidden part of the big blue bump*, MNRAS, 364, 640-648.
- Socrates, A., **Blaes, O.**, Hungerford, A., & Fryer, C. L. 2005. *The Neutrino Bubble Instability: A Mechanism for Generating Pulsar Kicks*, ApJ, 632, 531-562.
- Turner, N. J., **Blaes, O. M.**, Socrates, A., Begelman, M. C., & Davis, S. W. 2005. *The Effects of Photon Bubble Instability in Radiation-Dominated Accretion Disks*, ApJ, 624, 267-288.
- Davis, S. W., **Blaes, O. M.**, Hubeny, I., & Turner, N. J. 2005. *Relativistic Accretion Disk Models of High State Black Hole X-ray Binary Spectra*, ApJ, 621, 372-387.
- Shang, Z., Brotherton, M. S., Green, R. F., Kriss, G. A., Scott, J., Quijano, J. K., **Blaes, O.**, Hubeny, I., Hutchings, J., Kaiser, M. E., Koratkar, A., Oegerle, W., & Zheng, W. 2005. *Quasars and the Big Blue Bump*, ApJ, 619, 41-59.
- Kishimoto, M., Antonucci, R., Boisson, C., & **Blaes, O.** 2004. *The Buried Balmer-Edge Signatures from Quasars*, MNRAS, 354, 1065-1092.
- Ballantyne, D. R., Turner, N. J., & **Blaes, O. M.** 2004. *X-ray Reflection from Inhomogeneous Accretion Disks: I. Toy Models and Photon Bubbles*, ApJ, 603, 436-448.
- Socrates, A., Davis, S. W., & **Blaes, O.** 2004. *Turbulent Comptonization in Black Hole Accretion Disks*, ApJ, 601, 405-413.
- Blaes, O.**, & Socrates, A. 2003. *Local Radiative Hydrodynamic and Magnetohydrodynamic Instabilities in Optically Thick Media*, ApJ, 596, 509-537.
- Kishimoto, M., Antonucci, R., & **Blaes, O.** 2003. *A First Close Look at the Balmer Edge Behavior of the Quasar Big Blue Bump*, MNRAS, 345, 253-260.
- Chiang, J., & **Blaes, O.** 2003. *Using Multiwavelength Observations to Determine the*

- Black Hole Mass and Accretion Rate in the Type 1 Seyfert Galaxy NGC 5548*, ApJ, 586, 97-111.
- Blaes, O.**, Lee, M. H., & Socrates, A. 2002. *The Kozai Mechanism and the Evolution of Binary Supermassive Black Holes*, ApJ, 578, 775-786.
- Blaes, O.**, Hubeny, I., Agol, E., & Krolik, J. H. 2001. *Non-LTE, Relativistic Accretion Disk Fits to 3C 273 and the Origin of the Lyman Limit Spectral Break*, ApJ, 563, 560-568.
- Hubeny, I., **Blaes, O.**, Krolik, J. H., & Agol, E. 2001. *Non-LTE Models and Theoretical Spectra of Accretion Disks in Active Galactic Nuclei. IV. Effects of Compton Scattering and Metal Opacities*, ApJ, 559, 680-702.
- Chiang, J., & **Blaes, O.** 2001. *Thermal Comptonization and Disk Thermal Reprocessing in NGC 3516*, ApJ, 557, L15-L18.
- Blaes, O.**, & Socrates, A. 2001. *Local Dynamical Instabilities in Magnetized, Radiation Pressure Supported Accretion Disks*, ApJ, 553, 987-998.
- Agol, E., Jones, B., & **Blaes, O.** 2000. *Keck Mid-Infrared Imaging of QSO 2237+0305*, ApJ, 545, 657-663.
- Hubeny, I., Agol, E., **Blaes, O.**, & Krolik, J. 2000. *Non-LTE models and theoretical spectra of accretion disks in active galactic nuclei III. Integrated spectra for hydrogen-helium disks*, ApJ, 533, 710-728.
- Chiang, J., Reynolds, C. S., **Blaes, O. M.**, Nowak, M. A., Murray, N., Madejski, G., Marshall, H. L., & Magdziarz, P. 2000. *Simultaneous EUVE/ASCA/RXTE Observations of NGC 5548*, ApJ, 528, 292-305.
- Magdziarz, P., **Blaes, O. M.**, Zdziarski, A. A., Johnson, W. N., & Smith, D. A. 1998. *A spectral decomposition of the variable optical, ultraviolet, and X-ray continuum of NGC 5548*, MNRAS, 301, 179-192.
- Hsu, C.-M., & **Blaes, O.** 1998. *Compton scattering of polarized radiation in two phase accretion disks in active galactic nuclei*, ApJ, 506, 658-672.
- Thompson, C., & **Blaes, O.** 1998. *Magnetohydrodynamics in the Extreme Relativistic Limit*, Phys. Rev. D, 57, 3219-3234.
- Agol, E., **Blaes, O.**, & Ionescu-Zanetti, C. 1998. *Polarization from magnetized accretion disks: II. The effects of absorption opacity on Faraday rotation*, MNRAS, 293, 1-17.
- Blaes, O.**, Hurt, T., Antonucci, R., Hurley, K., & Smette, A. 1997. *Infrared observations of the possible X-ray counterpart to the 1992 May 1 gamma-ray burst*, ApJ, 479, 868-874.
- Blaes, O.**, & Agol, E. 1996. *Polarization near the Lyman edge in accretion disk atmosphere models of quasars*, ApJ, 469, L41-L44.
- Agol, E., & **Blaes, O.** 1996. *Polarization from magnetized accretion disks in active galactic nuclei*, MNRAS, 282, 965-976.

- Blaes, O.**, Warren, O., & Madau, P. 1995. *Accreting, isolated neutron stars: III. Pre-heating of infalling gas and cometary HII regions*, ApJ, 454, 370-381.
- Clarke, T. E., **Blaes, O.**, & Tremaine, S. 1994. *Do gamma-ray bursts come from the Oort cloud?*, AJ, 107, 1873-1878.
- Madau, P., & **Blaes, O.** 1994. *Constraints on accreting, isolated neutron stars from the ROSAT and EUVE surveys*, ApJ, 423, 748-752.
- Blaes, O. M.**, & Balbus, S. A. 1994. *Local shear instabilities in weakly ionized, weakly magnetized disks*, ApJ, 421, 163-177.
- Blaes, O.**, & Madau, P. 1993. *Can we observe accreting, isolated neutron stars?*, ApJ, 403, 690-705.
- Blaes, O. M.**, Blandford, R. D., Madau, P., & Yan, L. 1992. *On the evolution of slowly accreting neutron stars*, ApJ, 399, 634-645.
- Blaes, O. M.**, & Webster, R. L. 1992. *Using gamma-ray bursts to detect a cosmological density of compact objects*, ApJ, 391, L63-L66.
- Blaes, O.**, & Rajagopal, M. 1991. *The statistics of slow interstellar accretion onto neutron stars*, ApJ, 381, 210-219.
- Blaes, O.**, Blandford, R., Madau, P., & Koonin, S. 1990. *Slowly accreting neutron stars and the origin of gamma-ray bursts*, ApJ, 363, 612-627.
- Blaes, O. M.**, Goldreich, P. M., & Villumsen, J. V. 1990. *The dominant local instabilities in an Einstein-de Sitter universe*, ApJ, 361, 331-337.
- Blaes, O.**, Blandford, R., Goldreich, P., & Madau, P. 1989. *Neutron starquake models for gamma-ray bursts*, ApJ, 343, 839-848.
- Blaes, O.**, & Hawley, J. 1988. *Nonaxisymmetric disk instabilities: a linear and nonlinear synthesis*, ApJ, 326, 277-291.
- Abramowicz, M., **Blaes, O.**, & Ghosh, P. 1987. *A new example of the Papaloizou-Pringle instability*, ApJ, 323, 629-633.
- Blaes, O. M.** 1987. *Stabilization of non-axisymmetric instabilities in a rotating flow by accretion on to a central black hole*, MNRAS, 227, 975-992.
- Blaes, O.**, & Glatzel, W. 1986. *On the stability of incompressible constant angular momentum cylinders*, MNRAS, 220, 253-258.
- Blaes, O.** 1985. *Oscillations of slender tori*, MNRAS, 216, 553-563.
- Blaes, O.** 1985. *An upper limit to the growth rate of instabilities in constant specific angular momentum tori*, MNRAS, 212, 37P-40P.

(b) *Articles in refereed conference proceedings*

- Blaes, O.** 2013. *General overview of black hole accretion theory* (Review article for the International Space Science Institute volume on The Physics of Accretion onto

Black Holes, eds. T. Belloni, P. Casella, M. Falanga, M. Gilfanov, P. Jonker and A. King, Space Science Reviews, submitted.

Blaes, O. M. 1994. *Theories of gamma-ray bursts* (Review article for the 1993 INTEGRAL workshop on The Multi-Wavelength Approach to Gamma-Ray Astronomy), ApJS, 92, 643-649.

Webster, R., & **Blaes, O.** 1993. *Are gamma-ray bursts at cosmological distances?*, PASAu, 10, 271-273.

(c) *Telegrams and circulars*

Drinkwater, M. J., Jones, L. A., **Blaes, O. M.**, Hurt, T., Antonucci, R., & Hurley, K. 1997. *GRB 920501*, IAU Circular No. 6600.

(d) *Invited Review Articles and Lectures*

Blaes, O. M. 2003. *Physics Fundamentals of Luminous Accretion Disks Around Black Holes*, in *Accretion Disks, Jets, and High Energy Phenomena in Astrophysics*, Proceedings of Session LXXVIII of Les Houches Summer School, Chamonix, France, August 2002, V. Beskin, G. Henri, F. Menard, G. Pelletier, and J. Dalibard eds. (EDP Science: Paris and Springer: Berlin), 137-185.

Koratkar, A., & **Blaes, O.** 1999. *The ultraviolet and optical continuum emission in active galactic nuclei: the status of accretion disks*, PASP, 111, 1-30.

(e) *Articles in non-refereed conference proceedings*

Kishimoto, M., Antonucci, R., **Blaes, O.**, Lawrence, A., Boisson, C., Albrecht, M., & Leipski, C. 2008. *AGN accretion disks as spatially resolved by polarimetry*, in Proceedings of "The Universe Under the Microscope - Astrophysics at High Angular Resolution", Journal of Physics: Conference Series, Volume 131, ed. R. Schoedel, A. Eckart, S. Pfalzner, & E. Ros

Fragile, P. C., Anninos, P., **Blaes, O. M.**, & Salmonson, J. D. 2008. *3D Relativistic MHD Simulation of a Tilted Accretion Disk Around a Rapidly Rotating Black Hole*, in Proceedings of the 11th Marcel Grossmann Meeting on General Relativity, ed. H. Kleinert, R. T. Jantzen, & R. Ruffini, 1573-1575.

Blaes, O. 2007. *Accretion Disks in AGNs*, in *The Central Engine of Active Galactic Nuclei*, ASP Conference Series Vol. 373, ed. L. C. Ho & J.-M. Wang (San Francisco: ASP), 75-84.

Kishimoto, M., Antonucci, R., & **Blaes, O.** 2007. *The near-IR shape of the big blue bump emission from quasars: under the hot dust emission*, in *The Central Engine of Active Galactic Nuclei*, ASP Conference Series Vol. 373, ed. L. C. Ho & J.-M.

- Wang (San Francisco: ASP), 105-108.
- Socrates, A., Davis, S. W., & **Blaes, O.** 2006. *Turbulent Comptonization in Relativistic Accretion Disks*, AdSpR, 38, 2880-2883.
- Kishimoto, M., Antonucci, R., Boisson, C., & **Blaes, O.** 2004. *Revealing AGN by Polarimetry*, in *Astronomical Polarimetry: Current Status and Future Directions*, ASP Conference Series 343, eds. A. Adamson, C. Aspin, & C. J. Davis, 435.
- Turner, N. J., Yorke, H. W., Socrates, A., & **Blaes, O. M.** 2004. *Photon bubbles in young massive stars*, in *Gravitational Collapse: from Massive Stars to Planets*, eds. G. Garcia-Segura, G. Tenorio-Tagle, J. Franco, & H. W. Yorke, Rev. Mex. AASC, 22, 54-57.
- Kishimoto, M., Antonucci, R., Boisson, C., & **Blaes, O.** 2004. *Accretion around supermassive black holes: the detection of the Balmer edge signature from quasars*, in *Stellar Mass, Intermediate Mass, and Supermassive Black Holes*, Progress of Theoretical Physics Supplement, No. 155, 166-169.
- Chiang, J., & **Blaes, O.** 2004. *Using Multiwavelength Observations to Estimate the Black Hole Masses and Accretion Rates in Seyfert Galaxies*, in *AGN Physics with the Sloan Digital Sky Survey*, ASP Conference Series, G. T. Richards and P. B. Hall, eds., 127.
- Antonucci, R., Kishimoto, M., Boisson, C., & **Blaes, O.** 2004. *The Shape of the Big Blue Bump as Revealed by Spectropolarimetry* in *AGN Physics with the Sloan Digital Sky Survey*, ASP Conference Series, G. T. Richards and P. B. Hall, eds., 381.
- Blaes, O.** 2004. *Accretion Disks Based on Real Physics*, in *AGN Physics with the Sloan Digital Sky Survey*, ASP Conference Series, G. T. Richards and P. B. Hall, eds., 121.
- Davis, S., **Blaes, O.**, Turner, N., & Socrates, A. 2004. *Effects of Fluid Instabilities on Accretion Disk Spectra*, in *AGN Physics with the Sloan Digital Sky Survey*, ASP Conference Series, G. T. Richards and P. B. Hall, eds., 135.
- Kishimoto, M., Antonucci, R., & **Blaes, O.** 2003. *A First Close Look at the Balmer-edge Behavior of Quasar Big Blue Bump*, in *Active Galactic Nuclei: from Central Engine to Host Galaxy*, eds. S. Collin, F. Combes, & I. Shlosman, ASP Conference Series, vol. 290, 217.
- Chiang, J., & **Blaes, O.** 2001. *Thermal Comptonization and Disk Thermal Reprocessing in Type 1 Seyfert Galaxies*, in *JHU/LHEA Workshop on X-ray Emission from Accretion onto Black Holes*, eds. T. Yaqoob & J. H. Krolik, published electronically at www.pha.jhu.edu/groups/astro/workshop2001.
- Blaes, O. M.**, Hubeny, I., Agol, E., & Krolik, J. H. 2001. *Thermal Emission from Accretion Disks*, in *JHU/LHEA Workshop on X-ray Emission from Accretion onto Black Holes*, eds. T. Yaqoob & J. H. Krolik, published electronically at www.pha.jhu.edu/groups/astro/workshop2001.
- Shields, G. A., Agol, E., & **Blaes, O.** 2001. *The puzzle of the Lyman continuum polariza-*

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- Blaes, O.** 2000. *Supermassive Black Holes As Gravitational Wave Sources for LISA*, in *Gravitational Waves, Third Edoardo Amaldi Conference*, ed. S. Meshkov, (Melville, NY: AIP), 248-254.
- Magdziarz, P., **Blaes, O.**, & Madejski, G. 1999. *Variability of the UV/Soft X-ray Continuum in NGC 5548*, in *Workshop on High Energy Processes in Accreting Black Holes*, ed. J. Poutanen & R. Svensson, (San Francisco: ASP), 204-209.
- Blaes, O.** 1998. *General Relativity As Seen In X-rays: What Can LISA Tell Us That We Don't Already Know?*, in *Laser Interferometer Space Antenna, Second International LISA Symposium on the Detection and Observation of Gravitational Waves in Space*, ed. W. Folkner, (Woodbury, NY: AIP), 57-60.
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- Agol, E., Hubeny, I., & **Blaes, O.** 1998. *Continuum spectra of quasar accretion disk models*, in *Accretion Processes in Astrophysical Systems: Some Like It Hot!*, eds. S. S. Holt & T. R. Kallman, (Woodbury, NY: AIP), 175-178.
- Magdziarz, P., & **Blaes, O.** 1998. *A model of the broad-band continuum of NGC 5548*, *The Hot Universe*, Proceedings of the 188th Symposium of the IAU, eds. K. Koyama, S. Kitamoto, & M. Itoh (Dordrecht: Kluwer), 430-431.
- Magdziarz, P., **Blaes, O.**, Zdziarski, A. A., Johnson, W. N., & Smith, D. A. 1997. *Broad-band continuum and variability of NGC 5548*, Proceedings of the 4th Compton Symposium, eds. Dermer, C. D., & Kurfess, J. D., (Woodbury, NY: AIP), 1288-1292.
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- Madau, P., **Blaes, O.**, Blandford, R., & Goldreich, P. 1989. *Neutron starquakes and the nature of gamma-ray bursts*, in *Proceedings of the 1988 International School of Plasma Astrophysics*, Varenna, Italy, T. D. Guyenne & J. J. Hunt, (Noordwijk: ESA), 247-250.

Blaes, O. 1988. *The stability of thick accretion disks*, in *Supermassive Black Holes*, M. Kafatos, (Cambridge: Cambridge University Press), 334-343.

Abramowicz, M., **Blaes, O.**, & Lu, J. 1986. *On the Papaloizou and Pringle instability*, in *Structure and Evolution of Active Galactic Nuclei*, G. Giuricin et al., (Dordrecht: Reidel), 113-127.

(f) Other scholarly writing

Blaes, O. 2004. *A Universe of Disks*, *Scientific American*, October 2004, 48-57.

Dressler, A., Allamandola, L., **Blaes, O. M.**, et al. (many others) 2002. *ORIGINS 2003, Roadmap for the Office of Space Science Origins Theme*, NASA/Jet Propulsion Laboratory publication JPL 400-1060.

Blaes, O. 2001, Book Review on *Exploring Black Holes: Introduction to General Relativity*, by E. F. Taylor and J. A. Wheeler, page 59 in November 2001 issue of *Physics Today*.