# Giorgio Matt – Curriculum Vitae

Born in Roma (Italy) on 18 March 1961

Education: 1992 Ph.D., Astronomy, University of Rome, Italy
1985 Laurea Degree, Physics, University of Rome, Italy

Appointments:
2011- Full Professor, Dipartimento di Matematica e Fisica, Universita' degli Studi Roma Tre, Italy
1998-2010 Associate Professor, Facolta' di Science, Dipartimento di Fisica, Universita' degli Studi Roma Tre, Italy
1995-98 Researcher, Facolta' di Science, Dipartimento di Fisica, Universita' degli Studi Roma Tre, Italy
1993-95 Researcher, IAS/CNR, Italy
1992-93 Postdoctoral Research Fellow, Institute of Astronomy, University of Cambridge, U.K.

Current Assignments:
Member of the Scientific Team of the X-ray satellite NuSTAR, Chair of the "AGN Physics" Working Group
Co-I of the NASA approved X-ray polarimetric mission IXPE, co-chair of the Science Working Group and of the Science Advisory Team
Co-Chair of the topical panel "The Close Environment of supermassive black holes" of the ESA approved X-ray observatory Athena
Chair of the Panel 2 (Extragalactic) of the INTEGRAL OTAC (AO17-18)

Past Assignments:
2014-2017 Member of the Space Science Advisory Committee of the European Space Agency (ESA)
2015-17 Member of the XIPE mission Science Study Team
2013-16 Member of the Board of Directors, Universita' Roma Tre
2011-12 Head of the Dipartimento di Fisica, Universita' degli Studi Roma Tre, Italy
2008-10 Member of the Astronomy Working Group of the European Space Agency
2006-07 Chair of the panel E2 (AGN) of XMM-Newton OTAC (AO6-7)
2001-03 Member of the Science Committee of INAF (Italian Institute for Astronomy and Astrophysisc)

**Teaching:** He is currently teaching General Physics to second year students in the Physics course, and Astrophysics of Compact Objects to graduate students. In the past he also taught Extragalactic Astronomy and High Energy Astrophysics. He also lectured on High Energy Astrophysics in several national and international schools for graduate students. He has supervised many undergraduate (for their Laurea's thesis) and Ph.D. students.

**Research:** He has been working for about 30 years on the X-ray emission mechanisms in Active Galactic Nuclei and Galactic X-ray binaries, from both a theoretical and an

observational point of view.

He has been Principal Investigator of several successful proposals for observations with all major X-rays satellites in the last 2 decades (ROSAT, ASCA, RXTE, BeppoSAX, Chandra, XMM-Newton, Suzaku), and Co-Investigator in many others. He served in the Time Allocation Committees of X-ray satellites (BeppoSAX, Chandra and XMM-Newton, for the last mission also as panel chair) and ground based optical telescopes (TNG).

He authored and coauthored more than 350 papers on refereed international journals with high impact factors, and many conference proceedings. He served many times in the Science Organization Committees of international conferences, also charing the SOC for the X-ray Universe 2011 conference in Berlin. He was invited several times to give review talks at international conferences, and to give seminars in many scientific institutions around the world. He is often serving as a referee for the most important astrophysical international journals.

Regarding the theoretical research activity, he worked on the General Relativity effects on the radiation emitted around black holes. In both Active Galactic Nuclei and X-ray binaries, X-rays are emitted very close to the black holes, as deduced from e.g. causality arguments. The primary X-ray emission, probably originating in a hot corona, illuminates the matter accreting into the black hole via an accretion disc, where they may be reflected back through Compton scattering and produce emission line via fluorescence. The iron Kα line is the most prominent one, due to a combination of iron abundance and fluorescent yield. GM developed, has part of his Ph.D. thesis, a MonteCarlo radiative transfer code to calculate the “reprocessed” (i.e. Compton reflection plus fluorescent lines) spectra from low ionization matter, coupled with a fully relativistic code (in Schwarzschild metric, i.e. assuming a static black hole) to take into account the General and Special Relativistic effects which are very important at the deep gravitational potential, and the high matter velocity, to be found close to the black hole. Later on, he generalized the abovementioned codes to include, on one hand, the polarization properties of the radiation and, on the other hand, the ionization of the matter. First with his student A. Martocchia, and then in collaboration with V. Karas and M. Dovciak at the Academy of Science of the Czech Republic, he dealt also with the Kerr metric, to be applied for spinning black holes.

He also worked on the effects of obscuration and reflection from circumnuclear regions in Active Galactic Nuclei, calculating their emission/absorption spectra, with the main aim to make predictions useful to understand the physical, chemical and morphological properties of such matter and to test the Unification Model for AGN.

On the observational side, he analyzed the X-ray data of many AGN and galactic X-ray binaries aiming to find evidence for relativistic features. The main results are the confirmation, with BeppoSAX, of the relativistic nature of the iron line in the famous Seyfert galaxy MCG-6-30-15, the first discovery - again with BeppoSAX - of a relativistic line in a galactic Black hole system, GRS 1915+105, and the discovery – with XMM-Newton - that the relativistic line is not always present, after all.

He also found for the first time unambiguous evidence for purely reflected spectra – interpreted as emission from the putative dusty torus envisaged in Unification Models for Seyfert galaxies - in an highly obscured AGN (the Circinus Galaxy), determined the

characteristics of reflecting matter in Compton-thick AGN, and collaborated in a project aiming to establish the existence of “true” Seyfert 2 galaxies, i.e. sources in which the lack of observed broad lines is real and not due to obscuration.

With NuSTAR, he is studying the properties of the X-ray emitting corona in AGN, finding that the there is a large variety of coronal parameters (temperature and optical depth). He is also part of the collaboration, coordinated by P.O. Petrucci, to study the properties of the warm and hot coronae in AGN via spectral variability observed in XMM-NuSTAR monitoring campaign.

He devoted much effort in the calculation of polarization properties of accreting compact objects. In particular, he calculated the General Relatvity effects on the polarization of the reflected emission in Active Galactic Nuclei and X-ray binaries, and the polarization properties of accreting magnetized White Dwarfs. In collaboration with A. Celotti he calculated the polarization of the Synchrotron Self-Compton emission in Blazars; with the group at the Academy of Sciences of the Czech Republic he addressed the possibility to measure the spin of the black hole in accreting stellar-mass black hole via X-ray polarization; with R. Goosmann he estimated the X-ray polarization expected in Compton-Thick AGN.

He is heavily involved in the assessment of the scientific capabilities of X-ray polarimetric missions. In particular, he is one of the proposer of the NASA mission IXPE (Imaging X-ray Polarimetry Explorer), approved for a launch in April 2021. He is co-chair of both IXPE’s Science Working Group (which is defining the general mission policies) and of XIPE’s Science Advisory Team, in charge of defining the mission observing plan.