

CURRICULUM VITÆ

Ummi Abbas

Contact Information

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Education

Ph.D. in Physics, 2006: University of Pittsburgh, Pittsburgh (USA)

Thesis title: “ *The environmental dependence of dark matter and galaxy clustering*”

Thesis Advisors: Prof. Ravi K. Sheth (University of Pennsylvania, ICTP - Trieste)
& Prof. David A. Turnshek (University of Pittsburgh)

Master Degree (MSc) in Physics, 2002: University of Pittsburgh, Pittsburgh (USA)
GPA = 3.9/4.

Master Degree (MSc) in Physics, 2000: Utkal University, Bhubaneswar (India)

Current and Past Positions, Fellowships

1) **Researcher** (7/2020 - present):

INAF - Osservatorio Astronomico di Torino, Pino Torinese, Italy

2) **Assegnista/Young Scientist** (1/2013 - 6/2020):

INAF - Osservatorio Astronomico di Torino, Pino Torinese, Italy

3) **Assegnista/Research Fellow** (11/2010 - 12/2012):

INAF - Osservatorio Astronomico di Torino, Pino Torinese, Italy

4) **Marie Curie Fellow** (ELSA Training Network) (6/2008 - 8/2010):

INAF - Osservatorio Astronomico di Torino, Pino Torinese, Italy

5) **Postdoctoral Research Fellow** (5/2006 - 5/2008):

CNRS, Laboratoire d'Astrophysique de Marseille, France

6) **Mary Warga Fellow** (9/2000 - 4/2001, 9/2001 - 12/2001, 5/2005 - 8/2005):

University of Pittsburgh, Department of Physics & Astronomy, Pittsburgh (USA)

Publications

132 publications (97 refereed) as of February 19, 2021.

Total citations \sim 17k; h-index = 43 (source: ADS Abstract Service, click for updated list).

13 conference proceedings (including one invited review), 23 technical notes.

Selection of Refereed Publications

1) **Abbas, U.**; Bucciarelli, B.; Lattanzi, M. G.

“Differential Astrometric Framework for the Jupiter Relativistic Experiment with Gaia”,
Monthly Notices of the Royal Astronomical Society, 485, 1147 (2019)

2) Gaia Collaboration; Smart, R. L.; Sarro, L. M.; Rybizki, J.; Reylé, C.; Robin, A. C.; Hambly, N. C.; **Abbas, U.** et al.

“Gaia Early Data Release 3: The Gaia Catalogue of Nearby Stars”,
Astronomy & Astrophysics, accepted (2021)

3) **Abbas, U.**; Bucciarelli, B.; Lattanzi, M. G.; Crosta, M.; Gai, M.; Smart, R.; Sozzetti, A.; Vecchiato, A.

“The Short-term Stability of a Simulated Differential Astrometric Reference Frame in the Gaia Era”,
Publications of the Astron. Society of the Pacific, Volume 129, Issue 975, 4503 (2017)

4) Lindegren, L. et al.

“Gaia Data Release 2. The astrometric solution”,
Astronomy & Astrophysics, Volume 616, id.A2 (2018)

5) **Abbas U.**, de la Torre S., Le Fèvre O., Guzzo L., Marinoni C., et al.

“The VIMOS-VLT Deep Survey: evolution in the halo occupation number since $z \sim 1$ ”,
Monthly Notices of the Royal Astronomical Society, 406, 1306 (2010)

6) **Abbas U.** & Sheth R. K.

“Strong clustering of underdense regions and the environmental dependence of clustering from Gaussian initial conditions”,
Monthly Notices of the Royal Astronomical Society, 378, 641 (2007)

7) **Abbas U.** & Sheth R. K.

“The environmental dependence of galaxy clustering in the Sloan Digital Sky Survey”,
Monthly Notices of the Royal Astronomical Society, 372, 1749 (2006)

Research Interests

1) Astrophysical applications of astrometry:

- high-precision global and differential astrometric modeling and simulations;
- extraction and Production of Cluster Catalogues based on proper motions;
- kinematic membership of open clusters;
- classification of binary members in the Gaia Catalog for Nearby Stars (GCNS).

2) Local cosmology and experimental relativity:

- formulation and implementation of a relativistic model for astrometric data reduction;
- reconstruction of the global astrometric sphere;
- fundamental physics research e.g. deviations in GR, Jupiter quadrupole deflection;
- development and application of numerical tools (e.g. Vector Spherical Harmonics) to study local and global systematics in simulated and real data.

3) Large scale structure of the universe and its evolution:

- quantification of the dark matter-galaxy connection;
- development and utilization of analytical tools to perform in-depth studies of theoretical models of dark matter haloes and galaxies;
- numerical studies of the correlation function;
- reduction of galactic redshifts in high redshift galaxy surveys.