

Monica Tosi's Curriculum vitae

Education and Position:

- 1978: Laurea degree (at the time equivalent to PhD) *summa cum laude* (110/110 & *laude*) in Mathematics - Astronomy at the La Sapienza University (Rome, Italy);
- 1978-1979: Visiting scientist at the Rome Astronomical Observatory;
- 1980-1981: Post Doctoral Fellow at the Yale Astronomy Department (New Haven, USA)
- 1981-1989: Astronomer at the Bologna Astronomical Observatory;
- 1985: Associate Astronomer at the European Southern Observatory (ESO);
- 1986: Astronomer at the Space Telescope Science Institute (Baltimore, USA);
- 1989-2001: *Astronomo Associato* (Associate professor) at the Bologna Observatory;
- 2001-present: *Astronomo Ordinario* (Full Professor) at the Bologna Observatory.

Memberships and Services:

- 1986: Coordinator of the Committees for PhD and Summer Student fellowships at the Space Telescope Science Institute (Baltimore, USA);
- 1996: ESA member of the "Stellar Populations" panel for the HST TAC;
- 1998-1999: member of the "Nearby normal galaxies" panel in the ESO OPC;
- 2000-2002: referee for the TNG TAC;
- 2002-2011: Deputy Director of the Bologna Observatory;
- 2002: Coordinator of the INAF Working Group for the *MacroArea* Stars and ISM;
- 2002-2003: member of the INAF Working Group for Equal Opportunities;
- 2003-2006: member of the *Collegio dei Docenti* (Faculty Committee) for the Astronomy PhD at the Bologna University;
- 2003-2006: member of the Space Telescope Users Committee (STUC)
- 2005 and 2006: member of the HST TAC (chairperson of Panel Galac5 and then of Panel ExGal1);
- 2006-2007: Coordinator of INAF *Macroarea2* (Stellar Populations, Stars and ISM);
- 2006-2008: member of the ESO OPC (chairperson of Panel D4);
- 2006-2011: member of the ESO ELT Standing Review Committee;
- 2006-present: member of the Visiting Committee of the Space Telescope Science Institute (Baltimore);
- 2006-2012: member of the Organizing Committee of the IAU Commission 37 (star clusters and associations)
- 2008: chairperson of the ESO OPC
- 2008-2012: member of the Science Committee of the International Space Science Institute (Bern, CH)
- 2008-2010: member of the INAF Scientific Council
- 2009: chairperson of the ESO OPC Nominating Committee
- 2009-present: member of the JSTAC (JWST Science Technology Advisory Committee - Baltimore, USA)
- 2009-present: member of Panel PE9 of the European Research Council Starting Grants Committee
- 2010-2011: chair of the INAF Scientific Council;
- 2011-present: chair of the Visiting Committee of STScI (Baltimore, USA)
- 2011-present: member of the INAF Administration Council (CdA) and INAF Vice-President

Major scientific contributions:

I have devoted my research activity to different aspects of galaxy evolution, both with observational and theoretical approaches, always with innovative methodologies aimed at finding more reliable approaches and results. I have been one of the first to use Galactic open clusters as tracers of the disk evolution (e.g. Panagia & Tosi, 1981). I now work on the long-term Bologna Open Cluster Chemical Evolution (BOCCE) project aimed at homogeneously exploiting accurate photometry and spectroscopy of open clusters as tracers of the evolutionary properties of the Galactic disk (Bragaglia & Tosi 2006 and references therein). Early on, at Yale I worked on chemical evolution modelling with Beatrice Tinsley, the undisputed pioneer and founder of this research field. Then I developed my own numerical code for the chemical evolution of galaxies, the first worldwide to use the predictions from stellar nucleosynthesis to study not only the solar neighbourhood but also the evolution of the whole disk, both in our Galaxy and in other spirals (Diaz & Tosi, 1984; Tosi & Diaz 1985). I was the first to model the detailed chemical evolution of individual external galaxies, thus building the bridge between galactic and extra-galactic studies. What still distinguishes my works is that I always try to have a critical and *objective* view of the uncertainties affecting both the procedures and their results (e.g. Tosi 1988a).

One of the issues with galaxy evolution modelling is the number of free parameters. This motivated me to pioneer a method to remove, whenever possible, one of the major free parameters: the star formation law. To this purpose I devised a method to derive the star formation histories (SFH) of galaxy regions from the Colour-Magnitude Diagram (CMD) of their resolved stellar populations: the synthetic CMD method (Tosi et al 1991). This method computes synthetic CMDs based on stellar evolution models, compares them with the

observational ones, and infers the SFH which allows to best reproduce all the properties of the latter. The method has had a tremendous impact on the understanding of galaxy evolution, in particular of dwarf galaxies, specially after the advent of the refurbished HST in 1994. Nowadays the method is applied worldwide, and different groups have developed their own numerical procedures (see Tolstoy, Hill & Tosi 2009, ARAA 47, 371 and Cignoni & Tosi 2010 for comprehensive reviews and references). The inclusion of the *actual* SFH in the evolution modelling of galaxies has opened the road to accurate chemical evolution models of individual dwarf galaxies.

Observing Campaigns:

Over the years I have been PI or CoI of many successful applications for observing time at ground-based and space-based facilities. The vast majority of these programs were carried out at the ESO telescopes and on HST, but also at LBT, GranTeCan, Gemini, CFHT, CTIO, Kitt Peak, TNG. Since 1994 HST is the telescope of choice for deep, high-resolution photometry of crowded stellar fields. Since then, my group has been awarded almost 300 HST orbits for SFH studies of dwarf galaxies, including a treasury program (PI E. Sabbi) approved in 2012.

Academic Activities:

Thanks to the tight collaboration between my Observatory and the Astronomy Dept. of the Bologna University, I have been thesis advisor of more than 20 students and have tutored about ten more. For 4 years (2003-2006) I was a member of the PhD *Collegio dei Docenti* (Faculty Committee) of the Bologna University. I have served in the Scientific Assessment Committees for PhD theses of the Universities of Bologna, Groningen, Padua and Rome, and of the International School for Advanced Studies in Trieste. I have been member of the selection committees for associate and full professors at the Geneva, Pittsburgh, Uppsala, and Vienna Universities.

Funding Record:

- 2002: National PI of COFIN-MIUR-2002 "Stellar Populations in the Local Group as a tool to understand galaxy formation and evolution", 435Keuro
- 2003: Cofin-MIUR-2003 "Continuities and discontinuities in the formation of the Galaxy", 310Keuro
- 2004: PRIN-MIUR-2004 "The evolution of stellar systems: a fundamental step towards the scientific exploitation of VST", 380Keuro
- 2005: National PI of PRIN-INAF-2005 "Star formation histories of resolved galaxies: the local route to cosmology", 60Keuro
- 2007: PRIN-MIUR-2007 "Galactic Astro-archeology: the local route to cosmology", 141Keuro
- 2008: National PI of ASI-INAF I/016/07/0 "Stellar populations, star formation history and evolution of galaxies resolved with HST", 69Keuro
- 2008: PRIN-INAF-2008 "The ESO Magellanic Cloud Surveys: tracing the stellar populations and beyond", 120Keuro
- 2010: ASI-INAF-2009 "Ultra-faint dwarf galaxies: when size does matter", 72Keuro
- 2011: PRIN-INAF-2010 "Looking for the elusive building blocks of the Milky Way and Andromeda halos", 133Keuro.
- 2012: National PI of special project ("progetto premiale") funded by Italian Ministry of Research and Education "T-REX: Italian technologies for E-ELT, the largest telescope in the world", 3.9 Meuro.
- 2012: INAF PI of PRIN-MIUR-2011 "Chemical and dynamical evolution of the Milky Way and of the Local Group galaxies", 210Keuro

Publication Record:

I have published more than 300 papers, of which about 130 in the major refereed journals for astrophysics, about two dozens invited reviews and 200 contributions at international meetings. All these papers concern galaxy evolution studies. About 5000 citations (see ADS, H-index 40, normalized H-index 19) to these articles can be found in the literature.