The structure of galaxy disks shaped by secular evolution and environmental processes
Special session of EWASS 2012

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Scientific Organizing Committee

Paola Di Matteo (Observatoire de Paris, France),
Chanda J. Jog (Indian Institute of Science, Bangalore, India)

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FOREWORD

Galaxy interactions as well as internal secular processes are now known play a crucial role in determining the structure and evolution of galaxy disks. A one-day special session on ”Structure of galaxy disks shaped by secular evolution and environmental processes” was organized on July 2, 2012 at the EWASS 2012 conference held at the Pontificia Universita Lateranense, Rome. This special issue contains the scientific presentations at this special session.

In a typical spiral galaxy, a disk shows details whose origin and dynamics are not yet well-understood. These include, a thin disk and a thick disk component with vastly different kinematical properties; an extended radial structure with a fall-off at large radii that is not well-understood; misalignment in the outer parts as resulting in a warp; non-axisymmetric features like bars and spiral arms that are expected to lead to radial migration. Understanding the role secular evolution processes and environmental effects have in shaping galaxy disks requires to look for and to quantify the characteristics of all these different components - their sizes, dependence, if any, on the galaxy Hubble type and on the environment, their evolution with look-back time, and compare these with the predictions of numerical simulations and analytical models so as to better constrain the formation mechanisms.

The aim of this one day session was to make a cohesive study of the various topics in this area to see what is understood so far and what are the open problems. With this in mind, a variety of topics and scales were discussed - for example, from high redshift galaxies, to the dark matter and its impact on disk structure, to the Milky Way disk. The meeting brought together observers, modelers and theorists to make a fruitful interaction possible and to get a complete picture of this exciting and active area.

The one-day special session brought together about 60 participants from around the world. There were – invited review talks, – contributed talks, and – poster presentations. Various experts in the field presented new results, and in-depth reviews. There was a fair amount of discussion after each presentation. Thus we hope that this one day session would have made people realize the new, pressing issues and where progress is most needed in the near future.

Although many of the speakers could not submit the contributions due to lack of time, we hope that the Proceedings are still reasonably complete and will convey to the reader a flavour of this exciting one-day session, and give an idea about the latest results and trends in this field.

We thank all the participants for their active participation, and thank the local organizers of EWASS for their help in running things smoothly at this meeting.

P. Di Matteo, and C. J. Jog