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Astrophysical Masers: Unlocking the Mysteries of the Universe

Edited by

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IAU SYMPOSIUM 336

COVER ILLUSTRATION: SA GENTI ARRUBIA

Pink flamingos, or *sa genti arrubia* (the red people), as they are called in Sardinia, populate the ponds and salt marshes surrounding Cagliari. In particular, in the Ponds of Santa Gilla and the Molentargius Regional Park it is possible to admire hundreds of them, together with several other species of aquatic birds, wintering and nesting during their migration between Europe and Africa.

They are often seen with their heads under the shallow water in search of tiny crustaceans on which they feed, or, as shown in this photograph, during their pleasant and graceful flight, with their beautiful shades of colors offered by their spread wings.

It is particularly amazing, and likely the only place in the world, that these birds, usually so shy, stop and nest in Cagliari, a modern city, so highly urbanized and built up. This has led to the flamingos becoming a symbol of the town.

Photo credit: Gian Paolo Vargiu, INAF-Osservatorio Astronomico di Cagliari

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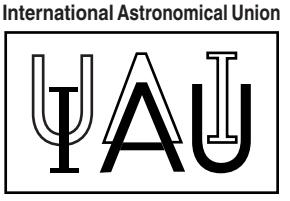

ASTROPHYSICAL MASERS: UNLOCKING THE MYSTERIES OF THE UNIVERSE

PROCEEDINGS OF THE 336th SYMPOSIUM OF THE INTERNATIONAL ASTRONOMICAL UNION HELD IN CAGLIARI, ITALY SEPTEMBER 4–8, 2017

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Table of Contents

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Galaxies and Supermassive Black Holes

Chairs: P. Castangia, J. Moran, W. Baan

https://doi.org/10.1017/S1743921318000984 Published online by Cambridge University Press

The Structure of the Milky Way

Chairs: Y. Xu, S. Ellingsen

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Star Formation

Chairs: J.-M. Torrelles, K.-T. Kim, Z. Abraham, C. Goddi

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https://doi.org/10.1017/S1743921318000984 Published online by Cambridge University Press

https://doi.org/10.1017/S1743921318000984 Published online by Cambridge University Press

Evolved Stars

Chairs: W.H.T. Vlemmings, A. Richards, L. Humphreys

https://doi.org/10.1017/S1743921318000984 Published online by Cambridge University Press

New facilities

Chairs: H.-J. van Langevelde, S. Breen

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Preface

The IAU Symposium No. 336, titled "Astrophysical Masers: Unlocking the Mysteries of the Universe", was held from the 4th to 8th of September 2017 in Cagliari (Italy), an enjoyable city with a variety of attractions for visitors, located in the southern part of Sardinia that hosts among the most beautiful seashores in the Mediterranean. The Symposium was attended by over 150 participants from 25 countries.

This Symposium was the fifth in a series of conferences dedicated to astrophysical masers. The previous conferences were held in the United States (Arlington, Virginia in 1992), Brazil (Angra dos Reis in 2001), Australia (Alice Springs in 2007), and South Africa (Stellenbosch in 2012). The Symposium was opened by the IAU General Secretary, Prof. Piero Benvenuti, who introduced the main aims and tasks of the IAU, underlined the relevance of the IAU Symposia, welcomed the participants, and officially started the Symposium.

Astronomical masers touch on a very broad range of astrophysical phenomena, from those taking place in massive star forming regions and evolved stars, to those in accretion disks around super-massive black holes. Thus, masers provide invaluable tools to estimate fundamental astronomical quantities, such as gas motions, distances, and black hole masses. Since the last conference there has been an explosion of work on masers, especially related to the cosmic distance scale, the structure of the Milky Way, and the masses of (AGN) black holes.

Indeed, the important results presented in over 140 contributions (oral and posters), all of very high quality, and arranged in six oral sessions and two poster sessions, have once again demonstrated that molecular masers are fundamental tools to provide answers to many of the most important and puzzling mysteries of modern astronomy. In addition, the Symposium testified to the dramatic growth of the field due to improvements in astrometry with VERA and the VLBA, and the coming online of major new facilities, like ALMA, eMERLIN, and the KVN, and the promising opportunities offered by SKA and its pathfinders, and the Next Generation VLA.

In the framework of the intense programme spiced up with stimulating discussions, the participants had the chance to visit the site of the 64-m Sardinia Radio Telescope, located in the Gerrei area. This facility, as illustrated during the Symposium in some scientific talks, is indeed an excellent instrument to perform forefront observational programmes in maser science, both in Galactic and extragalactic environments, as a single-dish and as part of VLBI arrays.

In order to leave a significant legacy in the community after the Symposium, educational and outreach activities took place in parallel with the scientific programme.

The editors would like to thank our sponsors and all the personnel of the Osservatorio Astronomico di Cagliari for their support. In addition, we would like to thank the SOC and LOC members. We are particularly grateful to Alberto Sanna, Ciriaco Goddi, Gabriele Surcis, and Luca Moscadelli who conceived of holding this Symposium in Sardinia and supported it throughout its realization. Last, but not least, we thank the staff of the Hotel Regina Margherita in Cagliari, the venue of the conference, for their professionalism and kindness.

Andrea Tarchi, Mark Reid & Paola Castangia

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