

## FOREWORD

The international conference *Stellar Pulsation and Evolution* was held in Villa Mondragone (Monte Porzio Catone, Rome) on June 19-24, 2005. It was number XVII of the Pulsation Meeting series started in July 26-27, 1971 in Los Alamos. The meeting was attended by more than 200 participants coming from 25 different countries. Villa Mondragone (XVI century), the conference center of the University of Rome Tor Vergata, is located on top of a hill overlooking Rome. The scientific sessions were held in the *Salone degli Svizzeri*, the very hall where Pope Gregory XIII promulgated in February 1582 the *bullā inter gravissimas* for the reform of the Julian calendar. Although the current calendar is called *Gregorian*, we would like to mention the three astronomers, Luigi Lilio, Christopher Clavius, and Egnazio Danti, who defined the rules of the reform.

During the 4.5 days of the meeting 22 invited talks, 69 oral contributions, and 119 posters were presented. A good fraction of the posters ( $\approx 30$ ) were transformed into short oral (5 minutes) presentations to give the opportunity to young colleagues to introduce directly their results. The chairpersons of the various sessions were: A.R. Walker, G. Bono, G. Clementini, H.B. Richer, P.B. Stetson, W. Gieren, W. Freedman, S. Vauclair, J. Christensen-Dalsgaard, S. Kawaler, K.R. Pollard, and A. Baglin. All in all, the current proceedings include more than 180 contributions, and we warmly thank all the authors who helped us in the editorial work. At the same time, we are also very grateful to the editor of *Memorie della Società Astronomica Italiana*, Piercarlo Bonifacio and his staff for the help in the final revision of the contributions.

The meeting was characterized by a very full schedule, but the SOC members nevertheless decided to have long coffee, lunch, and tea breaks, as good opportunities for informal discussions and socializing, and this was very successful. After the welcome reception and registration on Sunday 19 in a warm summer afternoon, the meeting officially began with the welcome address of Prof. Nicola Vittorio, the Dean of the Science faculty of the University of Rome Tor Vergata. For Tuesday evening's entertainment, following a wine tasting of local Frascati wines, we saw the musical comedy *Rap-Sodia* performed by *Dosto & Yevsky*. It was a challenging but very successful choice arranged by Luigi Pulone, the Chairman of the Local Organizing Committee. The Social Dinner was held in the old Villa del Cardinale (XVII century) on Wednesday 22. We arrived there immediately after the sunset, but the view on the Castel Gandolfo lake, Rome, and the sea coast illuminated by the full moon was quite spectacular. We also had a free afternoon on Thursday 23 for the Social Trip, with two different ancient roman destinations: Villa Adriana, close to the small town of Tivoli, and Ostia Antica, quite near to the sea coast. The weather was excellent, but probably a bit too hot!

We would like to thank the technical and the administrative staff of both the Rome Observatory and Villa Mondragone: and in particular Giuliana Giobbi, Giorgia Ortolani, Federica Zaccaretti, Erica Caccin, Desy Catena, Beatrice Bitsch, and Giulio Casale whose enthusiastic support was fundamental to cope with the organization of a meeting of this kind. We are very grateful to Giuliana for her crucial help and support over more than one year. Our warm thanks also to Simone Mattana, Marco Castellani, and Luigi Pulone for their paramount effort in dealing with the many different presentation styles. We also wish to thank graduate and PhD students Licia Troisi, Giuliano Giuffrida, Silvia Pedicelli, Giuliana Fiorentino, Matteo Monelli, and Massimo Dall'Ora, who handled and

solved several difficult problems and tasks before and during the meeting. They have been crucial for the positive outcome of the meeting. Our special thanks to Liù Catena for her unique and lively support in the organization of the meeting. In particular, she was the perfect *Domina*, during the meeting, dealing with plenty of different logistic and administrative problems. It was really an unusual pleasure to have worked with such enthusiastic team.

The poster of the meeting and the booklet of the abstracts were created by OM-Grafica and the photographer was Gabriele Merolli. We would like to express our gratitude for their valuable and friendly service. We also wish to thank for their efficiency Tribioli s.r.l in dealing with the transportation, CST-Ciccarelli s.r.l. for the sound technical assistance, and in particular Pepe Catering for the quality and timing of coffee, lunch, and tea breaks.

Finally, we are particularly indebted to Roberto Buonanno, the former Director of the Rome Astronomical Observatory, for his invaluable support before and during the meeting. We also heartily thank Ilaria Ermolli and the Center for Solar Variability of the Rome Observatory for their help in sharing several logistic problems in the organization of the meeting.

The conference was sponsored by the National Institute for Astrophysics, the Rome Astronomical Observatory, and the Department of Physics of the University of Rome Tor Vergata.

We also wish to express our thanks to Dott.ssa V. Sampaolo, Soprintendente of the *Soprintendenza per i Beni Archeologici delle province di Napoli e Caserta* for giving us the permission to take the photograph of the mosaic showing the Philosophers in the Academy which we used both for the meeting poster and for the cover of the proceedings volume.

During the review of the papers, we learned that Norman H. Baker was no longer with us. Norman was one of the founders of the stellar pulsation theory and attended several pulsation meetings. In recognition of his outstanding scientific legacy the SOC members decided to dedicate this volume to him. We have also included an obituary written by W. Dziembowski, A. Gautschi, and D. Gough outlining Norman's fundamental scientific contributions.

Alistair Walker and Giuseppe Bono

### Cover Illustration:

Mosaic: **Philosophers in the Academy**

Material: marble and glass paste tesserae

Size: 86 × 85 cm

Date: I century A.D.

Discovery: Pompeii, *Villa of Titus Siminius Stephanus*

Location: *Soprintendenza per i Beni Archeologici di Napoli e Caserta, # 124545*

This mosaic dating to the I century A.D. is the copy of a Greek original made in the Hellenistic age around 200 B.C. It portrays seven wise men engaged in discussion. The identification with Plato and his school appears authorised by the consideration that all of the subjects are holding scrolls; the depiction of the globe representing the heavenly sphere and the figure holding a rod, indicate that they are discussing problems of astronomy. The globe is contained in a wooden box, though some of it is visible. The colour of the tesserae used seems to suggest that it was made of crystal. Apparently, starting from the III century B.C., the first mechanical planetariums appeared. They were realized by extending earlier studies in the field of pneumatics and water clocks. The large mechanical model of the Universe made by Archimedes, was built in Syracuse, Sicily, and carried to Rome by the Senator Marcellus (212 B.C.). Cicero described this planetarium, in *De Republica* and in the *Tusculanae Disputationes* as capable of showing all the motions of celestial bodies simultaneously.

According to Konrad Gaiser (1980), the philosophers from left to right should be: Eraclides Ponticus, Speusiphus (the successor of Plato at the Academy), Plato in the middle, Eratosthenes of Cyrene (perhaps this mosaic decorated his tomb), Eudossus of Cnydus, mathematician and astronomer, Xenocrates and Aristotheles. In the background on the right, we can see the Parthenon of Athens.

There is a copy of the same Greek original mosaic, which was made at least a century after this Pompeii one, it was found in Sarsina in the 18th century and is now kept in the Villa Albani, Rome.

The stellar isochrones and the Zero Age Horizontal Branch models plotted in the figure have been constructed by Castellani et al. (2003, A&A, 404, 645; see also

<http://astro.df.unipi.it/SAA/PEL/Z0.html>). For more details concerning individual ages and chemical compositions the reader is referred to Monelli et al. (2003, AJ, 126, 218).

The poster also shows the Near-Infrared light curves of two fundamental RR Lyrae stars belonging to the Galactic globular cluster M68. For more details the reader is referred to Dall'Ora et al. (this volume).

**List of Pulsation Meetings:**

- XVII)** *Stellar Pulsation and Evolution*, ed. A.R. Walker, & G. Bono, MemSAIt, vol. 77, June 19-24, 2005, Rome Astronomical Observatory, Monte Porzio Catone (Italy)
- XVI)** *Variable Stars in the Local Group*, IAU Colloq. 193, ed. D.W. Kurtz, & K.R. Pollard, (San Francisco: ASP), vol. 310, July 6-11, 2003, University of Canterbury, Christchurch (New Zealand)
- XV)** *Radial and Nonradial Pulsations as Probes of Stellar Physics*, IAU Colloq. 185, ed. C. Aerts, T.R. Bedding, & J. Christensen-Dalsgaard, (San Francisco: ASP), vol. 259, July 26-31, 2001, University of Leuven, Leuven (Belgium)
- XIV)** *The Impact of Large-Scale Surveys on Pulsating Star Research*, IAU Colloq. 176, ed. L. Szabados & D.W. Kurtz, (San Francisco: ASP), vol. 203, August, 8-12, 1999, Konkoly Observatory, Budapest (Hungary)
- XIII)** *A Half Century of Stellar Pulsation Interpretations: A Tribute to Arthur N. Cox*, ed. P.A. Bradley, & J.A. Guzik, (San Francisco: ASP), vol. 135, June 16-20, 1997, Oppenheimer Study Center, Los Alamos (USA)
- XII)** *Astrophysical Applications of Stellar Pulsation*, IAU Colloq. 155, ed. R.S. Stobie, & P.A. Whitelock, (San Francisco: ASP), vol. 83, February 6-10, 1995, SAAO Cape Town (South Africa)
- XI)** *New Perspectives on Stellar Pulsation and Pulsating Variable Stars*, IAU Colloq. 139, ed. J.M. Nemeč & J.M. Matthews, (Cambridge: Cambridge University Press), July 15-18, 1992, DAO Victoria, British Columbia (CA)
- X)** *Confrontation between Stellar Pulsation and Evolution*, ed. C. Cacciari, & G. Clementini, (San Francisco: ASP), vol. 11, May 28-31, 1990, Osservatorio Astronomico di Bologna, Bologna (Italy)
- IX)** *The Use of Pulsating Stars in Fundamental Problems of Astronomy*, IAU Colloq. 111, E.G. Schmidt, (Cambridge: Cambridge University Press), August 15-17, 1988, University of Nebraska, Lincoln (USA)
- VIII)** *Stellar Pulsation*, ed. A.N. Cox, W.M. Sparks, & S.G. Starrfield, Lecture Notes in Physics (Berlin: Springer-Verlag), Vol. 274, August 11-15, 1986, Oppenheimer Study Center, Los Alamos (USA)
- VII)** *Cepheids: Theory and Observations*, IAU Colloq. 82, ed. B.F. Madore, (Cambridge: Cambridge University Press), May 29-June 1, 1984, University of Toronto, Toronto (CA)
- VI)** *Pulsations in Classical and Cataclysmic Variable Stars*, ed. J.P. Cox, & C.J. Hansen, (Astrophysics Report), June 1-4, 1982, JILA University of Colorado, Boulder (USA)
- V)** *Stellar Hydrodynamics*, IAU Colloq. 58, ed. A.N. Cox & D.S. King, Sp. Sci. Rev. (Dordrecht: Reidel), Vol. 27, August 12-15, 1980, Oppenheimer Study Center, Los Alamos (USA)
- IV)** *Current Problems in Stellar Pulsation Instabilities*, ed. D. Fischel, J.R. Lesh, & W.M. Sparks, (NASA Technical memorandum 80625), June 1-2, 1978, NASA Goddard Space Flight Center, Greenbelt (USA)
- III)** *Solar and Stellar Pulsation Conference*, ed. A.N. Cox & R.G. Deupree, (LASL Report, LA-6544C), August 3-5, 1976, Physics Auditorium, Los Alamos (USA)
- II)** *Cepheid Modeling*, ed. D. Fischel & W.M. Sparks (NASA SP-383; Washington, DC: NASA), July, 1974, NASA Goddard Space Flight Center, Greenbelt (USA)

I) July 26-27, 1971 T-Division Conference Room, Los Alamos (USA)<sup>1</sup>

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<sup>1</sup> Proceedings are not available for the first pulsation meeting. This meeting was attended among the others by Norm Baker, John Castor, Bob Christy, Art Cox, John Cox, and Icko Iben to discuss their progress in understanding the periods and growth rates of all those many classes of variable stars the observers were finding (Art Cox, private communication).