MEMORIE DELLA SOCIETÀ ASTRONOMICA ITALIANA

Vol. 74, n. 1, 2003

IV NATIONAL CONFERENCE ON INFRARED ASTRONOMY

Perugia, December 4-7, 2001

editors: S. Ciprini, M. Busso, G. Tosti and P. Persi

TABLE OF CONTENTS

Space-Borne Infrared Astronomy

IV NATIONAL CONFERENCE ON INFRARED ASTRONOMY

(IN HONOUR OF PAOLO MAFFEI)

Palazzo Manzoni, Facoltà di Lettere e Filosofia,
Università degli Studi di Perugia
Perugia, Italy, December 4-7, 2001

EDITED BY

Stefano Ciprini
Università di Perugia

Maurizio Busso
Università di Perugia

Gino Tosti
Università di Perugia

Paolo Persi
Istituto di Astrofisica Spaziale e Fisica Cosmica, CNR, Roma

SPONSORING INSTITUTIONS

Programma Nazionale di Ricerche in Antartide (PNRA)
Presidenza dell'Istituto Nazionale di Astrofisica (INAF)
INAF - Osservatorio Astronomico di Torino
Università degli Studi di Perugia
Società Astronomica Italiana

SCIENTIFIC ORGANIZING COMMITTEE

M. Busso (Co-chair - Università di Perugia)
A. Ferrari (INAF Consiglio Direttivo, e Università di Torino)
G. Mantovani (Università di Perugia, e Istituto Nazionale di Fisica Nucleare)
P. Persi (Co-chair - Istituto di Astrofisica Spaziale e Fisica Cosmica, CNR, Roma)
G. Tosti (Università di Perugia)

LOCAL ORGANIZING COMMITTEE

M. Bagaglia (Università di Perugia)
E. Berardi (Università di Perugia)
S. Ciprini (Università di Perugia)
G. Nucciarelli (Università di Perugia)

Collaborators:
N. Marchili (Università di Perugia)
M. Menguzzato (INAF Osservatorio Astronomico di Torino)
F. Porcu (INAF Osservatorio Astronomico di Torino)
M. Ragni (Università di Perugia)
A. Tramacere (Università di Perugia)

With the patronage of Regione Umbria

Fig. 1. The Conference poster.

Fig. 2. Some moments of the Conference, held in the eighteenth-century *Manzoni Palace* of the Perugia University (Faculty of Literature and Philosophy).

In the cover: A particular of *l'Astronomia* (the Astronomy), the fresco of Gentile da Fabriano (1370-1427) from the Liberal Art Hall (or Hall of the Planets) of the *Trinci Palace* in the town of Foligno (Perugia, Italy). This Hall is so named because it contains frescos of *Trivium* and *Quadrivium* arts (Grammar, Dialectic, Music, Geometry, Philosophy, Astronomy, Arithmetic and Rhetoric) and frescos of the planets (seven: Moon, Mars, Mercury, Jupiter, Venus, Saturn and the Sun). They are related to the human ages (seven: Childhood, Puerility, Adolescence, Youth, Maturity, Senility, Decrepitude) and to the hours of the day. The frescos in the Hall of Planets represent, at an iconographic level, a *summa* of the Medioeval culture. Seven planets for seven human ages, each under the influence of a planet. The influence of each planet is different in different moments of the day, much like what happens in our life, in which we learn different disciplines at different ages. (Reproduced with permission of *Comune di Foligno)*.

FOREWORD

Several years have passed since 1989, when the last national meeting fully dedicated to infrared astronomy was held in Gallipoli. Before then, there was a sort of agreement among the groups working in the field to remain in touch organizing, in turn, a workshop every three or four years as a chance to meet and discuss the common problems of a relatively restricted community, almost a club of amateurs.

In those days the complex procedures of infrared observations, the pioneer-like equipment, especially for exploiting mid-infrared bands, prevented most researchers from becoming fully familiar with the studies of cool matter in star formation regions and around evolved stars. What is normally defined as Infrared (i.e. researches at wavelengths between a few and around a hundred μm) was living as a separate island, detached not only from optical astronomy, but also from the work going on at millimeter wavelengths, preferentially sharing techniques and interests with radio astronomy.

A lot of things have happened since then. In Italy, immediately after the Gallipoli workshop, two projects started, which provided the first two national infrared cameras using bi-dimensional arrays: Arnica (for near infrared observations) and Tircam (for mid infrared wavelengths), both exploiting the possibilities of the national infrared telescope TIRGO, a remarkable piece of Occhialini's heritage. Abroad, infrared imaging started to grow as a common technique for providing information not to a selected community of peculiar old-fashioned experimental physicists, but to all astronomers interested in the reddened environments of our Galaxy and in distant objects well outside its limits. Quickly, modern instrumentation became available at Hawaii telescopes, in American and European observatories in Chile, then in several good, dry mountain astronomical sites. Finally, the preparation and launch of the ISO satellite definitely put an end to the era of the specialized, separate field of infrared astronomy; this last ceased to be an esoteric matter for *aficionados*, and grew simply as one of the many, powerful tools available to modern astronomical research.

These facts make clear why twelve years had to pass before a new Italian infrared meeting could take place: the need for a conference on a limited area became less obvious. They also explain the complexities of the material contained in this book, where the fascinating discussions of the Perugia workshop are reported. While speaking of infrared astronomy, we are now forced to deal with a lot of different but very integrated subjects, so strictly cross-correlated that the borders fade away; we are actually dealing with the whole astronomical research, simply looked at from a specific perspective.

It is important that, while we finally witness the complete integration of our research field in modern astronomy, we do not miss the links that have taken us so far, and the history behind all this. In Italy, an important part of this history is related to Paolo Maffei's name and to the pioneering lines of work he strongly suggested to pursue many years ago, when nobody believed in the possibilities of his techniques. Holding this workshop in Perugia, where he has been teaching for so many years, assumes therefore a peculiar meaning: that of a tribute from a mature scientific community to its origins. This community is today happy to gather for speaking of fascinating new instrumentation, both ground-based and space-borne, but also (and especially) to express its gratitude and its good wishes to Paolo, in the moment when he leaves active teaching.

In this respect, all of us want also to thank the Faculty of Sciences of the Perugia University and its dean, Prof. Mantovani, who have recently honored Paolo with the title of *Professor Emeritus*, in an acknowledgement of his longstanding work to which we all associate. The University of Perugia has also decided that this work must be continued; and I am grateful to the *Magnifico Rettore* Prof. Bistoni, to the Faculty of Sciences and to the Department of Physics for the possibility I've been given to pursue Paolo's efforts in teaching and promoting Astrophysics in Perugia.

For the Organizing Committee
Maurizio Busso

Participating Authorities

- **On. Prof. Gaia Grossi**
  Assessore alla Ricerca, Politiche Formative, Politiche Attive del Lavoro e Politiche Sociali della Regione Umbria, e Università di Perugia
  `formazione@regione.umbria.it`

- **Prof. Giorgio Bonamente**
  Preside della Facoltà di Lettere e Filosofia, Università di Perugia
  `preslet@unipg.it`

- **Prof. Giancarlo Mantovani**
  Preside della Facoltà di Scienze Matematiche, Fisiche e Naturali, Università di Perugia, e Istituto Nazionale di Fisica Nucleare (INFN)
  `preside@pg.infn.it`

- **Prof. Attilio Ferrari**
  Consiglio Direttivo dell'Istituto Nazionale di Astrofisica (INAF), e Università di Torino
  `ferrari@ph.unito.it`

- **Ing. Mario Zucchelli**
  Capo Progetto Antartide ENEA, e Responsabile dell'Attuazione del Programma Nazionale di Ricerche in Antartide (PNRA)
  `mario.zucchelli@casaccia.enea.it`

Prof. Giancarlo Setti (Presidente INAF, e Università di Bologna) and Prof. Carlo Alberto Ricci (Vice Presidente Commissione Scientifica Nazionale per l'Antartide, CSNA, e Università di Siena) could not attend, but were present with their written good wishes to our Conference and to Paolo Maffei.