

PREFACE

The publication of this volume coincides with the 55th anniversary of the discovery of the neutron and Landau's suggestion at the time that one could make stars out of the new particles. This year also marks the twenty-fifth anniversary of the detection of Sco X-1, the first known X-ray binary system, and follows by just twenty years Jocelyn Bell Burnell's discovery of that "little bit of scruff" on her chart record that led to the recognition of radio pulsars. As Q.Y. Qu, President of Nanjing University noted in his welcoming address, however, Chinese astronomers have been observing the consequences of neutron star formation for several millenia. It was appropriate, then, that this Symposium, the first International Astronomical Union meeting ever to be held in the Peoples Republic of China, be devoted to the topic of neutron stars.

IAU Symposium Number 125, "The Origin and Evolution of Neutron Stars", was convened on the morning of May 26, 1986 at Nanjing University, Nanjing, Peoples Republic of China. One hundred and thirty-nine participants from fifteen countries, including over eighty-five scientists who were visiting China for the first time, met each day for the following week to discuss where neutron stars come from, how they evolve, and where they go. The meeting was judged, by unanimous acclaim of the participants, to be a scientific, cultural, and culinary success. The thoughtful review articles, exciting abstracts, and vigorous discussion recorded in these pages attests to the scientific vitality of the endeavor, although the invaluable contacts and enduring ties between Chinese hosts and foreign guests will be remembered and cherished long after this volume is assigned to dead storage. As evidence of the culinary triumphs, the reader is referred to the partial menu of the Symposium Banquet reproduced below:

Sun-Flower-Shaped Cold Dishes
Peacock-Shaped Shelled Shrimps
Rice Crust with Three Delicacies
Specially-Cooked Chicken
Two-Different-Taste Prawn
Eight-Treasure Duck
Squirrel-Shaped Mandarin Fish
Seasonal Vegetables
Hot Candied Apple
Dessert

The Scientific Program for the meeting was designed by the Scientific Organizing Committee to reflect the aspects of neutron star observations and theory which are most germane to the origin and evolution of these remarkable objects. Thirty-seven invited speakers reviewed topics ranging from radio pulsar statistics to the theory of quasiperiodic oscillations, and from gamma ray burster observations to the possibility that neutron stars may, in fact, be made of quarks. More than seventy-five participants presented contributed poster papers (abstracts of which are included herein); each poster session was reviewed for the entire Symposium by an appointed interlocuter adding the latest in observational and theoretical developments to the general discussion. And throughout, the Local Organizing Committee produced meeting rooms for impromptu workshops, a profusion of tea, and a program of activities which fostered an ideal environment for the unfettered interchange of which this written version is but a partial reflection.

The field of neutron star astrophysics is in a state of heightened activity occasioned by a series of discoveries over the past few years which include millisecond pulsars, quasiperiodic oscillations, and ultrahigh energy emission from some accreting binary systems. With regard to the question of pulsar birthrates, the level of sophistication of the discussion has greatly improved recently; unfortunately, however, the increase in the error bars on birthrates resulting from this increasing sophistication has just compensated for the decrease in the uncertainties accompanying new and better data. It is my admittedly biased belief that the birthrate of neutron stars in the Galaxy is still uncertain by a factor of at least three. The formerly isolated fields of radio and X-ray pulsars and globular cluster X-ray sources have been drawn closer together by proposed scenarios for QPOs and millisecond pulsar evolution, although the genetic relationships are still far from determined. Gamma ray burster statistics are beginning to provide important constraints on such matters as magnetic field decay, binary evolution and neutron star space densities, while the discovery of a growing number of Crab-like and composite supernova remnants sets new limits on the properties of newly-born neutron stars. This increasing cross-fertilization amongst subfields bodes well for future progress in our understanding of the origin and evolution of neutron stars.

It is to be hoped that IAU Symposium Number 125, in some small way, helped foster such progress. At this writing, we are blind to the clues neutron stars are sending us in the infrared, ultraviolet, X-ray, and gamma-ray bands. By the time of publication, we will be back on the air, at least in X-rays, with the Japanese satellite ASTRO-C. In the coming decade, it remains our fond hope that a uniquely powerful series of satellite observatories will be in place to provide us with critical observations in these important wavelength regimes. Coupled with the increasing sensitivity of ground-based telescopes and new theoretical advances, both pre-

licated on ever-cheaper computational power, future insight for neutron star astrophysicists is assured.

Ultimately, the success of this meeting will be judged by the degree to which it will hasten the obsolescence of these Proceedings.

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