

**Letter of Intent to Propose an IAU Symposium on
NEUTRON STARS & BLACK HOLES IN BINARIES AND STAR CLUSTERS**

Venue: IAU General Assembly in Prague, August 2006.

Organizers:

Main organizers: Fred Rasio (Northwestern U., USA) and Ingrid Stairs (UBC, Canada).

The following people have expressed enthusiasm for our proposal and have agreed to serve on the SOC and/or to be invited speakers: Tomek Bulik (Copernicus Center, Poland), Jorge Casares (IAC, Spain), Phil Charles (Cape Town, South Africa), Monica Colpi (U. Milano, Italy), Rob Fender (Southampton, UK), Pranab Ghosh (Tata Inst., India), Eric Gourgoulhon (CNRS Meudon, France), Eva Grebel (U. Basel, Switzerland), Josh Grindlay (Harvard U., USA), Izumi Hachisu (U. Tokyo, Japan), Vicky Kaspi (McGill, Canada), Andrew King (U. Leicester, UK), Andrea Lommen (Franklin and Marshall, USA), Dick Manchester (CSIRO, Australia), Felix Mirabel (Saclay, France; IAFE, Argentina), Hans Ritter (MPA, Germany), Masaru Shibata (U. Tokyo, Japan), Luigi Stella (Rome Obs., Italy), Ed van den Heuvel (U. Amsterdam, The Netherlands), Marten van Kerkwijk (U. Toronto, Canada).

Proceedings Editors: Rob Fender, Vicky Kaspi, & Fred Rasio.

Main Topics: X-ray binaries in the Milky Way and other galaxies; radio and X-ray millisecond pulsars; X-ray transients; optical reprocessing and fast variability; X-ray sources and radio pulsars in globular clusters; compact objects in massive binaries and starbursts; connection to gamma-ray bursts; modeling of accretion disks; quasi-periodic oscillations; ultra-luminous X-ray sources; formation and evolution of massive binaries; supernovae and kicks in binaries; compact binaries as sources of gravitational waves; relativistic binaries and tests of general relativity.

Rationale: Our proposed symposium is broadly aimed at the large community of astronomers around the world working on compact objects in interacting binary systems and in star clusters. The main scientific topics cut across all traditional boundaries, including Galactic and extragalactic astronomy, environments from young starbursts to old globular clusters, phenomena from radio pulsars to gamma-ray bursts, and observations using ground-based and space-based telescopes, with a significant component of gravitational-wave astronomy and relativistic astrophysics. Great advances have occurred in this field during the past few years, including the introduction of fundamentally new theoretical paradigms for the formation and evolution of compact objects in binaries as well as countless new discoveries by astronomers that have challenged many accepted models. Some of the highlights include: a complete census of all the millisecond pulsars in 47 Tuc; the discovery of a double radio pulsar system; the detection of the first X-ray millisecond pulsars; the first clear evidence of a supernova origin for a stellar black hole; detailed studies of X-ray binary populations and their luminosity functions in many galaxies. The next few years will prove at least as exciting, with many more data sets coming from recently or soon-to-be launched high-energy satellites (INTEGRAL, Swift), many new objects found in extensive deep radio and X-ray surveys (Chandra, XMM-Newton, Parkes and Arecibo multibeam surveys), and follow-up spectroscopy and photometry with optical telescopes (HST, Keck, VLT, SALT).

Suggested Coordinating Division: Division XI (Space & High Energy Astrophysics); Proposing Commission: Commission 44 (Space and High Energy Astrophysics).

Potential Supporting Divisions: Division IV (Stars), Division V (Variable Stars), Division VII (Galactic System), Division IX (Optical & Infrared Techniques), Division X (Radio Astronomy).

Potential Supporting Commissions: 9, 25, 26, 27, 28, 30, 31, 33, 35, 37, 40, and 42.