N. Lewandowska, University of Würzburg, Würzburg:
"VHE observations of the Crab pulsar with the MAGIC telescope system"

abstract: *"The detection of the first pulsar in 1967 opened a view on a new kind of stellar objects. In spite of this detection over 40 years ago, the mechanism and origin of their emission in the magnetosphere are still not understood. Among the numerous observations of pulsars at different wavelengths, the observations at VHE energies with satellites and groundbased Cherenkov telescopes have contributed significantly to the general picture of pulsars in the last 10 years. The MAGIC stereo telescope system is unique among Imaging Atmospheric Cherenkov Telescopes due to its good sensitivity at low energies and offers a powerful tool for investigating the physics of extreme objects like pulsars. Mono observations in combination with a special trigger system enabled the detection of the Crab pulsar in 2008 at energies above 25 GeV and led to the exclusion of the Polar Cap model. Within the framework of this presentation we show latest results from mono and stereo observations of the Crab pulsar with the MAGIC telescope system revealing significant pulsed emission in the energy range from 25 GeV to 400 GeV in the main pulse (P1) as well as the interpulse (P2).*
Representing the widest spectra of the VHE components of both peaks we include a discussion of their physics implications together with models in which the VHE component is produced by inverse Compton scattering of IR-UV photons by secondary and tertiary electrons and positrons."

A. Lobanov, Max-Planck-Institute of Radioastronomy (MPIfR), Bonn:
"A Pulsar and a Flare: HST and VLBI Observations of Active Regions in the Crab Nebula"

abstract: *"An unusually strong and long-lasting high-energy flare was detected in late September 2010 in the Crab nebula by AGILE and Fermi/LAT. A putative flaring region was identified in follow-up high-resolution observations with Chandra and HST -- suggesting that the flare was located either in the jet or near the inner wisp of the nebula. An EVN+MERLIN observation of the Crab nebula was made in November 2010 at 1.6GHz, aiming at detecting and localising a radio counterpart of the flare. The 1.6 GHz data have enabled imaging the inner regions of the nebula on scales of up to ~40", yielding arguably the largest structure ever imaged with VLBI. The emission from the inner ``wisps'' is detected for the first time with VLBI observations. A likely radio counterpart of the putative flaring region observed with Chandra and HST is detected in the radio image. Further information on these flaring region has been obtained from subsequent HST and LOFAR observations. Combined together, these observations have provided a new insight on the mechanism of flare production in the Crab nebula."*

R. Neuhaeuser, Astrophysical Institute and University Observatory (AIU), Jena:
"Was the AD 774/5 cosmic-ray event a supernova?"

abstract: *"For AD 774/5, a rapid and strong increase within one year in 14C in Japanese tree rings was observed indicating a strong cosmic- and gamma-ray input (Miyake et al. 2012). Solar and stellar flares are unlikely as cause because of the insufficient energy, a supernova (SN) was also found to be unlikely, because there are no reports about a historic SN sighting nor a SN remnant, but the SN remnants Cas A and Vela Jr were not fully excluded (Miyake et al. 2012). Hence, the cause for the AD 774/5 event remained unknown (Miyake et al. 2012). We will present the data about the AD 774/5 event and will discuss, whether a SN is still possible as its cause. In particular, by comparing the samples of historic SN observations, young nearby SN remnants, and young nearby neutron stars, we can (re-)evaluate the probability of missing a SN observation."*

J. Schmidt, Astrophysical Institute and University Observatory (AIU), Jena:
"Where to search for unknown nearby neutron stars"

abstract: *"We created a catalogue of all OB stars and massive red giants within a distance of 3 kpc. We restricted our first catalogue to those objects observed by both HIPPARCOS and 2MASS, because they are observed best and have best precision. Hence, with BVJHK photometry we estimated interstellar absorption and with V band magnitude and known parallax we derived the luminosity. Using the spectral classification we were able to derive mass and age with evolutionary models (Schaller, 1992; Bertelli, 1994; Claret et al., 2004) and calculated the remaining lifetime (models from Tinsley, 1980; Maeder & Meynet, 1989; Kodama, 1997). Hence, we were able to derive the spatially and temporally resolved supernova-rate (SN) for the near future (which should be the same for the recent past). In the Solar vicinity (<600 pc) we derived a rate of about one event per 50 000 years (Hohle, Neuhäuser, Schutz, 2010).*
We then added to our catalogue all other massive OB stars, red giants and Wolf-Rayet stars known in the galaxy to enhance the sample for apparent fainter stars and raising the lower limits of the work before. Within 600 pc all SN events take place in 8% area of the sky, whereas 90% of the events take place in 5% area of the sky. For a distance of 5 kpc 90% of all SN events take place in only 9% area of the sky (Schmidt et al. in prep.). If the SN rate in the near future is the same to the recent past, there should be unknown neutron stars (NSs) concentrated in those areas. 100...150 NSs are expected within 1 kpc and younger than 5 Myr (Popov et al., 2003-2010; Palomba 2005), also considering large space velocities.
Only ca. 10% of those numbers are known today (ATNF database). Thus it seems very promising to search for young nearby neutron stars in the areas predicted by us. Although those stars may not be detectable in the X-rays they are potential source of gravitational waves, if those NSs are not rotating perfectly spherical and/or precessing. The restricted search to our spatial distribution allows to restrict searches like Einstein@home to certain small areas on the sky, i.e. to perform them with higher sensitivity (Wette et al., 2008)."

T. Tauris, University of Bonn/ Max-Planck-Institute of Radioastronomy (MPIfR), Bonn:
"The detection rate of merging neutron stars / black holes"

abstract: *"The direct detection of astrophysical gravitational waves is expected within a few years when the aLIGO detector, together with its European sister VIRGO and GEO 600, will reach full sensitivity. The most promising candidate sources for transient burst detections of high-frequency gravitational waves (10 Hz - 10 kHz) are merging neutron stars (NS) and black holes (BH). In this talk I discuss the predicted detection rate of merging NS/BH. It is demonstrated how this detection rate depends on stellar evolution and binary interactions such as common envelopes, naked helium star evolution and asymmetric SN explosions. The merger rate is closely related to the properties, numbers and lifetimes of high-mass X-ray binaries, radio pulsars with NS/BH companions and short gamma-ray bursts, as well as galactic models of the local Universe."*

L. Trepl, Astrophysical Institute and University Observatory (AIU), Jena:
"Is there a compact companion orbiting the late O-type binary star HD 164816?"

abstract: *"We present a multi-wavelength (X-ray, gamma-ray, optical and radio) study of HD 164816, a late O-type X-ray detected spectroscopic binary. X-ray spectra are analyzed and the X-ray photon arrival times are checked for pulsation. In addition, newly obtained optical spectroscopic monitoring data on HD 164816 are presented. They are complemented by available radio data from several large scale surveys as well as the FERMI gamma-ray data from its Large Area Telescope. We report the detection of a low energy excess in the X-ray spectrum that can be described by a simple absorbed blackbody model with a temperature of ~50eV as well as a 9.78 s pulsation of the X-ray source. The soft X-ray excess, the X-ray pulsation, and the kinematical age would all be consistent with a compact object like a neutron star as companion to HD 164816. The size of the soft X-ray excess emitting area is consistent with a circular region with a radius of about 7 km, typical for neutron stars, while the emission measure of the remaining harder emission is typical for late O-type single or binary stars.*
If HD 164816 includes a neutron star born in a supernova, this supernova should have been very recent and should have given the system a kick, which is consistent with the observation that the star HD 164816 has a significantly different radial velocity than the cluster mean. In addition we confirm the binarity of HD 164816 itself by obtaining an orbital period of 3.82d, projected masses $m_1 \sin^3 i = 2.355(69) M_o$, $m_2 \sin^3 i = 2.103(62) M_o$ apparently seen at low inclination angle, determined from high-resolution optical spectra."