Participant list
Xiamen-CUSTIPEN Workshop, Xiamen, January 3 to 7, 2019

No.	Name	Affiliation	Email
01	Shunke Ai 艾舜轲	Beijing Normal University, China	aishunke@mail.bnu.edu.cn
02	Nils Andersson	University of Southampton, UK	N.A.Andersson@soton.ac.uk
Contribution Title: Using gravitational waves to constrain matter at extreme densities Abstract: The spectacular GW170817 neutron star merger event provided interesting constraint on neutron star physics (in terms of the tidal deformability). Future detections are expected improve on this. In this talk I will discuss if we can expect to also make progress on issues relating to the composition and state of matter.			
03	Zhan Bai 摆展	Peking University, China	baizhan@pku.edu.cn
Contribution Title: Constraining Hadron-Quark Phase Transition Chemical Potential via Astronomical observation			
04	Shishao Bao 鲍世绍	Shanxi Normal University, China	baoshishao@sxnu.edu.cn
05	Andreas Bauswein	GSI Darmstadt, Germany	Andreas.Bauswein@h-its.org
Contribution Title: Neutron star mergers and the high-density equation of state			
06	Subrata kumar Biswal	Institute of Theoretical Physics, Chinese Academy of Sciences, China	sbiswal@itp.ac.cn
Contribution Title: Effects of the φ-meson on the hyperon production in the hyperon star Abstract: Using relativistic mean field formalism, we have studied the effects of the strange vector φ-meson on the equation of state and consequently on the maximum mass and radius of the hyperon star. Effects of the hyperon coupling constants on the strangeness content of the hyperon star are discussed with a number of the relativistic parameter set. The canonical mass-radius relationship also discussed with various relativistic parameter set. Shifting of the threshold density of the different hyperon production with inclusion of the φ-meson in relativistic mean field formalism are discussed in detail.			
07	Edward F. Brown	Michigan State University, USA	ebrown@pa.msu.edu
Contribution Title: Measuring the Specifc Heat and Neutrino Emissivity of Neutron Stars Abstract: Observational constraints on the mass-radius relation for neutron stars have improved considerably in the last decade. While this relation provides insight into the			

pressure-density relation of dense matter, it does not directly convey information about the composition of the interior. Observations of isolated cooling neutron stars provide constraints on the specific heat and neutrino emissivity of dense matter, but are limited by a small sample population and large systematic uncertainties in the age of the neutron star. In this talk, I will argue that for one system, MXB1659-29, the inferred core neutrino emissivity substantially exceeds that of the modified Urca process and is consistent with the direct Urca process operating over about 1% of the core volume. Finally, I will highlight how future observations of this source can place an upper limit on the core specific heat.			
08	Li-Gang Cao 曹李刚	North China Electric Power University, China	caolg@ncepu.edu.cn
09	Zhoujian Cao 曹周键	Beijing Normal University, China	zjcao@amt.ac.cn
Contribution Title: Apply discontinuous Galerkin method to Einstein equations Abstract: Finite difference method and pseudo-spectral method have been widely used in the numerical relativity to solve the Einstein equations. As the third major category method to solve partial differential equations, finite element method is much less used in numerical relativity. In principle finite element method may combine the high convergence advantage of pseudo-spectral method and the flexibility of finite difference method. Recently we designed a finite element algorithm to solve the evolution part of the Einstein equations. Especially the local discontinuous Galerkin method will be introduced in this talk.			
10	Nicolas Chamel	Université Libre de Bruxelles, Belgium	nchamel@ulb.ac.be
Contribution Title: Role of the symmetry energy on neutron stars within the nuclear energy density functional theory Abstract: The theory of the nuclear energy-density functional is used to provide a unified and thermodynamically consistent treatment of all regions of cold non-accreting neutron stars. In order to assess the impact of our lack of complete knowledge of the density dependence of the symmetry energy on the constitution and the global structure of neutron stars, we employ four different functionals. All of them were precision fitted to essentially all the nuclear-mass data with the Hartree-Fock-Bogoliubov method and two different neutron matter equations of state based on realistic nuclear forces. For each functional, we calculate the composition, the pressure-density relation, and the chemical potentials throughout the star. We show that uncertainties in the symmetry energy can significantly affect the theoretical results for the composition and global structure of neutron stars.			
11	Lie-Wen Chen 陈列文	Shanghai Jiao Tong University, China	lwchen@sjtu.edu.cn
Contribution Title: The equation of state of dense matter in the multimessenger era			
12	Yidian Chen 陈亦点	Institute of High Energy Physics, Chinese Academy of Sciences, China	chenyd@ihep.ac.cn
13	Quan Cheng 程泉	Wuhan University, China	qcheng@ihep.ac.cn

14	Andrew Cumming	McGill University, Canada	andrew.cumming@mcgill.ca
Contribution Title: Constraints on Neutron Star Interiors from Cooling Transients			
15	Zigao Dai 戴子高	Nanjing University, China	dzg@nju.edu.cn
Contribution Title: What's the central object after GW170817?			
16	Pawel Danielewicz	Michigan State University, USA	Danielewicz@nscl.msu.edu
Contribution Title: Stiff symmetry energy from isovector aura in charge-exchange reactions Abstract: On account of symmetry energy dropping with density, nuclear isovector density extends farther out than the isoscalar density, leading to an isovector aura surrounding a nucleus. The faster the drop of the symmetry energy and energy of neutron matter with density, the thicker the aura. The width and sharpness of the aura can be assessed by simultaneously analyzing elastic scattering and quasielastic charge-exchange data off the same target, with the two, respectively, testing primarily isoscalar and isovector densities. In the past (P. Danielewicz et al., Nucl. Phys. 958, 147 (2017)) we analyzed unpolarized nucleon elastic and quasielastic cross sections on 48Ca, 90Zr, 120Ca and 208Pb. We now augment the analyzed set with two more targets, 92Zr and 94Zr, and expand the data to include vector analyzing powers. We further augment data analysis by systematically estimating theoretical errors. The results consistently point to large widths, ~1fm, of the isovector aura, now for 6 nuclei. Such an aura implies stiff symmetry energy, with a slope parameter L>70MeV, and stiff energy of neutron matter. The neutron skins may be viewed as nucleus-dependent reflections of the aura.			
17	Wenbo Ding 丁文波	Bohai University, China	dingwenbo1980@163.com
Contribution Title: The Cooling of Dark-Matter-Admixed Neutron Star Abstract: After the GW170817 event of the binary neutron star merger in 2017, studies on neutron star are becoming hotter and hotter. In this work, the structure and cooling properties of dark-matter-admixed neutron stars are studied here in relativistic mean field theory and cooling theories. The non-self-annihilating dark matter (DM) component is assumed to be ideal fermions, and among which the weak interaction is considered. Results show that pulsars J1614-2230, J0348+0432 and EXO 0748-676 may all contain DM with the particle mass of 0.2-0.4GeV. However, it is found that the effect of DM on neutron star cooling is complicated. we may conjecture that if small and super cold pulsars were observed, the star may contain fermionic DM with weak self-interaction.			Poster No. 1
18	Jianmin Dong 董建敏	Institute of Modern Physics, Chinese Academy of Sciences, China	dongjm07@impcas.ac.cn

19	Alessandro Drago	Università degli Studidi Ferrara, Italy	drago@fe.infn.it
Contribution Title: Astrophysical tests of the two-families scenario Abstract: I will discuss the predictions of the two-families scenario for short GRBs. I will include in my presentation the results of the simulations of the merger of two neutron stars made in collaboration with the group of Parma by using the Einstein Toolkit. 1) Are Small Radii of Compact Stars Ruled out by GW170817/AT2017gfo? G.F. Burgio, A. Drago, G. Pagliara, H.J. Schulze, J.B. Wei. Astrophys.J. 860 (2018) 139; 2) Merger of two neutron stars: predictions from the two-families scenario. A. Drago, G. Pagliara. Astrophys.J. 852 (2018) no.2, L32; 3) The scenario of two families of compact stars : 1. Equations of state, mass-radius relations and binary systems. A. Drago, A. Lavagno, G. Pagliara, D. Pigato. Eur.Phys.J. A52 (2016) 40; 4) The scenario of two families of compact stars : 2. Transition from hadronic to quark matter and explosive phenomena. A. Drago, G. Pagliara. Eur.Phys.J. A52 (2016) 41.			
20	Jianjun Fang 房建军	Qufu Normal University, China	jian-junfang@163.com
21	Taotao Fang 方陶陶	Xiamen University, China	fangt@xmu.edu.cn
22	Zhaoqing Feng 冯兆庆	South China University of Technology, China	fengzhq@scut.edu.cn
Contribution Title: Strangeness production and hypernuclear formation in heavy-ion collisions and in hadron induced reactions			Poster No. 2
23	He Gao 高鹤	Beijing Normal University, China	gaohe@bnu.edu.cn
Contribution Title: Constraint on NS maximum mass from SGRBs data Abstract: Under the assumptions that Short GRBs are produced by double neutron star mergers and that the X-ray plateau followed by a steep decay as observed in SGRB X-ray light curves marks the collapse of a supramassive NS to a BH, I will show that current observations already impose interesting constraints on the NS maximum mass.			
24	Zhi-Fu Gao 高志福	Xinjiang Astronomical Observatory, Chinese Academy of Sciences, China	zhifugao@xao.ac.cn
Contribution Title: Evolutions of magnetic field and spin-down of neutron stars Abstract: Here we summarized our recent work on evolutions of magnetic field and spin-down of neutron stars mainly focusing on magnetars, X/gamma-ray pulsar PSR J1640-4631 with high braking index n=3.15 (3) and the high-magnetic-field pulsar PSR J1734-3333 with low braking index n=0.9(2). Our work includes the following three parts: (1) Based on the estimated ages of their potentially associated supernova remnants (SNRs), we estimate the values of the mean braking indices of eight magnetars with SNRs, and find that five			Poster No. 16

magnetars have smaller mean braking indices of $1 < n < 3$, and we interpret them within a combination of magneto-dipole radiation and wind-aided braking. The larger mean braking indices of $n > 3$ for the other three magnetars are attributed to the decay of external braking torque, which might be caused by magnetic field decay; (2) By introducing a mean rotation energy conversion coefficient, and combining the pulsar's high-energy and timing observations with a reliable nuclear equation of state, we estimate the initial spin period, initial dipole magnetic field and true age PSR J1640-4631, The measured braking index of n=3.15(3) for PSR J1640-4631 is attributed to its long-term dipole magnetic field decay and a low magnetic field decay rate, G yr^{-1}; (3) The low braking index pulsar PSR J1734-3333 could undergo a supercritical accretion soon after its formation in a supernova explosion. The buried multipole magnetic fields will merger into a dipole magnetic field. Since the magnetic flow transfers from the core to the crust of the pulsar, its surface dipole field grows quickly at a power-law form assumed, which results in the small braking index of $n = 0.9(2)$. Keeping the current field-growth index $\varepsilon = 1.34$, this pulsar will become a magnetar with and G after next 50 kyrs and 100 kys, respectively.			
25	Weimin Gu 顾为民	Xiamen University, China	guwm@xmu.edu.cn
26	Wenmei Guo 郭文梅	Shanxi University, China	guowm515@sxu.edu.cn
27	Sofia Han 韩君	Ohio University/UC Berkeley, USA	sjhan@berkeley.edu
Contribution Title: Theoretical implications of quiescent thermal emission of neutron stars			
28	Wynn C. G. Ho	Haverford College, USA	wynnho@slac.stanford.edu
Contribution Title: Cooling of the Cassiopeia A neutron star and the effect of diffusive nuclear burning Abstract: A critical relation in the study of neutron star cooling is the one between surface temperature and interior temperature. This relation is determined by the composition of the neutron star envelope and can be affected by the process of diffusive nuclear burning (DNB). We calculate models of envelopes that include DNB. We find that DNB can lead to a rapidly changing envelope composition which can be relevant for understanding the long-term cooling behavior of isolated neutron stars. We also report on the latest Chandra observations of the young neutron star in the Cassiopeia A supernova remnant, and we fit its observed cooling trend with a model that includes DNB.			
29	Jeremy Holt	Texas A&M University, USA	holt@physics.tamu.edu
Contribution Title: Constraints on the nuclear EOS from microscopic many-body theory			

Abstract: We review recent progress in the microscopic description of the nuclear equation of state from chiral two-and three-body forces.			
30	Jorge E. Horvath	IAG-USP, Brazil	foton@iag.usp.br
Contribution Title: The binaries of GW events Abstract: We discuss some issues related to the "NS-NS" binaries giving raise to GW-kilonovae events. The mass distribution and the outcome of an exotic (quark) composition are highlighted.			
31	Suqing Hou 侯素青	Institute of Modern Physics, Chinese Academy of Sciences, China	sqhou@impcas.ac.cn
32	Jinniu Hu 胡金牛	Nankai University, China	hujinniu@nankai.edu.cn
Contribution Title: The symmetry energy effect on the properties of neutron star Abstract: The properties of neutron star are studied with a family TM1 parameterization, whose isovector properties at saturation density are changed, while the isoscalar ones are fixed. The maximum mass and radius are not influenced by the symmetry energy and its slope so much. However, the properties of neutron star at 1.4 times solar mass are largely affected by the symmetry energy, like its mass, radius, and tidal deformability. These quantities have strong correlations with the slope of symmetry energy.			
33	Feng Huang 黄峰	Xiamen University, China	fenghuang@xmu.edu.cn
34	Xiulin Huang 黄修林	Changchun Observatory, National Astronomical Observatories, Chinese Academy of Sciences, China	huangxl@cho.ac.cn
Contribution Title: Effects of Tensor Couplings on Nucleonic Direct URCA Processes in Neutron Star Matter Abstract: The relativistic neutrino emissivity of the nucleonic direct URCA processes in neutron star matter is investigated within the relativistic Hartree–Fock approximation. We particularly study the influences of the tensor couplings of vector mesons ω and ϱ on the nucleonic direct URCA processes. It is found that the inclusion of the tensor couplings of vector mesons ω and ϱ can slightly increase the maximum mass of neutron stars. In addition, the results indicate that the tensor couplings of vector mesons ω and ϱ lead to obvious enhancement of the total neutrino emissivity for the nucleonic direct URCA processes, which must accelerate the cooling rate of the nonsuperfluid neutron star matter. However, when considering only the tensor coupling of vector meson ϱ, the neutrino emissivity for the nucleonic direct URCA processes slightly declines at low densities and significantly increases at high densities. That is, the tensor coupling of vector meson ϱ leads to the slow cooling rate of a			Poster No. 3

low-mass neutron star and rapid cooling rate of a massive neutron star.			
35	Xurun Huang 黄旭润	Shanghai Jiao Tong University, China	xr_huang@sjtu.edu.cn
36	Yong-Feng Huang 黄永锋	Nanjing University, China	hyf@nju.edu.cn
Contribution Title: Gravitational wave emission from merging strange quark star-strange quark planet systems Abstract: Strange-quark matter (SQM) may be the true ground state of hadronic matter, indicating that the observed pulsars may actually be strange stars (SSs), but not neutron stars. According to the SQM hypothesis, the existence of a hydrostatically stable sequence of SQM stars has been predicted, ranging from 1 to 2 solar mass SSs, to smaller strange dwarfs and even strange planets. While gravitational wave (GW) astronomy is expected to open a new window to the universe, it will shed light on the search for SQM stars. We show that due to their extreme compactness, strange planets can spiral very close to their host SSs without being tidally disrupted. Like inspiraling neutron stars or black holes, these systems would serve as new sources of GW bursts, producing strong GWs at the final stage. The events occurring in our local universe can be detected by GW detectors, such as Advanced LIGO and the future Einstein Telescope. This effect provides a unique probe to SQM objects and is hopefully a powerful tool for testing the SQM hypothesis.			
37	Fan Ji 纪凡	Nankai University, China	jifan@mail.nankai.edu.cn
38	Xiaochuan Jiang 姜小川		
39	David Ian Jones	University of Southampton, UK	D.I.Jones@soton.ac.uk
Contribution Title: The early life of millisecond magnetars Abstract: In this talk I will describe the physics that determines the spin evolution of millisecond magnetars, early in their lives. The results have implications for their gravitational wave emission, and for the distributions of spins and magnetic field geometries observed in the Galactic magnetar population.			
40	Taka Kajino 梶野敏貴	Beihang University, China/National Astronomical Observatory of Japan & The University of Tokyo, Japan	kajino@nao.ac.jp
Contribution Title: Impact of Neutron Star Merger and Supernova Nucleosynthesis on Nuclear Physics and Neutrino Physics Abstract: Optical and near-infrared emission from GW170817/SSS17a, which is possibly a neutron star merger (NSM) event, is consistent with radiative decays of theoretically predicted r-process abundance yield. Although neither emission or absorption line from			

specific r-process element was identified, it is a possible nucleosynthetic site in the solar-system r-process abundance at the present Universe. NSMs however could not contribute to the early Galaxy for their cosmologically long merging timescale due to too slow GW radiation (time scale problem). Core-collapse supernovae of both magneto-hydrodynamic jet (MHD Jet-SNe) and neutrino-driven wind (ν-wind SNe) also are the viable candidate. MHD Jet-SNe can naturally explain the "universality" of r-process elemental abundance pattern in EMP stars of the Milky Way halo and dwarf galaxies. We propose a novel solution to this twisted problem in our theoretical models of Galactic chemo-dynamical evolution including both NSM and SN r-process nucleosyntheses.
We also discuss the impact of the SN nucleosynthesis on the physics of neutrino oscillations. The elements around A = 80-100 near the 1st r-process peak have several nucleosynthetic processes such as r-, s-, rp-, γ-, νp-processes, etc. Although the ν-wind SNe are presumed to be the leading candidate for the 1st r-process peak, an required neutron-rich condition (Y_e < 0.5) has been put into question by failures of robust models for SNe if one assumes only the neutrino heating source to trigger an explosion. However, we find that the νp-process operates with amounts of free neutrons being supplied continuously in the proton-rich (Y_e > 0.5) materials via p(ν,e)n reactions when one takes account of the effects of collective neutrino oscillations in coherent self-interacting neutrino scatterings. Resultantly, nuclear reaction flows reach to produce abundant p-nuclei like Mo, Ru, etc. at A = 90-100. This nucleosynthetic method turns out to be a unique probe indicating the still unknown neutrino-mass hierarchy.

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42	Toru Kojo 古城 徹	Central China Normal University, China	kojo.toru@gmail.com

Contribution Title: Delineating the properties of matter in cold, dense QCD
Abstract: We delineate the properties of matter in cold, dense QCD through the construction of equations of state which are constrained by nuclear-astrophysical constraints as well as the plausible pictures based on hadron physics.

43	Abudushataer Kuerban 阿布都沙塔尔·库尔班	Nanjing University, China	lompa46@163.com
44	Dong Lai 赖东	Cornell University, USA	dong@astro.cornell.edu

Contribution Title: Neutron Star Seismology, Equation of State and Merging Binaries
Abstract: In merging neutron star (NS) binaries, tidal force can resonantly excite low-frequency (< 200 Hz) oscillation modes in the NS, transferring energy between the orbit and the NS. This resonant tide can induce phase shift in the gravitational waveforms, potentially provide a "clean" new window into the NS interior (including nuclear symmetry energy) using gravitational waves. This effect is distinct from the widely-discussed quasi-equilibrium tidal deformation effect, which is only important at high frequencies (~1000 Hz). I will review the current the status of NS seismology in merging binaries and discuss the

prospect for future studies.			
45	Xiaoyu Lai 来小禹	Hubei University of Education, China	laixy@pku.edu.cn
Contribution Title: Strangeon matter in kilonova Abstract: The nature of pulsar-like compact stars is essentially a problem of the low-energy properties of the fundamental strong force, and how to observationally test various models about the equation of state is one of challenges we have to face. In our previous work, we found that the observed gravitational waves GW170817 as well as the electromagnetic radiation could be understood if the signals come from the merge of two strangeon stars in a binary. Based on a brief summary about our previous work, we will discuss more about the radiative properties of the ejector from the merger, and try to find more evidences to test the strangeon star hypothesis.			
46	Paul Lasky	Monash University, Australia	paul.lasky@monash.edu
Contribution Title: Constraining the neutron star equation of state with binary neutron star post-merger remnants			
47	James Lattimer	Stony Brook University, USA	james.lattimer@stonybrook.edu
Contribution Title: Neutron Star Masses and Radii Abstract: I summarize the properties of neutron stars from X-ray observations, pulsar timing and gravitation radiation detections. The recent merger, GW170817, sets interesting limits on neutron star tidal deformabilities and masses, from which radius and equation of state information are found. Comparison is made to nuclear experimental information and recent theoretical studies of neutron and nucleon matter.			
48	Ang Li 李昂	Xiamen University, China	liang@xmu.edu.cn
Contribution Title: Neutron star equation of state for the quark level in the light of GW170817 Abstract: Matter state inside neutron stars is an exciting problem in astrophysics, nuclear physics and particle physics. The equation of state (EOS) of neutron stars plays a crucial role in the present multimessenger astronomy, especially after the event of GW170817. The unknown EOS of supranuclear matter could soon be understood thanks to accumulating studies on gravity, astrophysics and nuclear physics. The present work timely constructs a new EOS for NSs in the quark level, respecting all available constraints from terrestrial nuclear laboratory experiments and astrophysical observations, including the recent GW170817 constraint on the tidal deformability. The employed quark-mean-field (QMF) model also allows one to tune the density dependence of the symmetry energy and study effectively its correlations with the Love number and the tidal deformability.			
49	Bao-An Li 李宝安	Texas A&M University-Commerce, USA	Bao-An.Li@tamuc.edu
Contribution Title: Extracting high-density symmetry energy from astrophysical observations			

50	Xiang Li 李向	Peking University, China	1601110078@pku.edu.cn
51	Xiangdong Li 李向东	Nanjing University, China	lixd@nju.edu.cn
52	Lap-Ming Lin 練立明	The Chinese University of Hong Kong, China	lmlin@cuhk.edu.hk
Contribution Title: Universal relations for neutron stars Abstract: It is well known that the properties of neutron stars in general depend sensitively on the underlying equation-of–state (EOS) model for nuclear matter. Nevertheless, various approximately EOS-insensitive universal relations connecting the properties of a neutron star have been found in the past decade. In this talk, we will give a brief overview of our work in this area and point out how these universal relations could be used with gravitational-wave or electromagnetic-wave observations to probe the properties of neutron stars.			
53	Liangduan Liu 刘良端	Nanjing University, China	Liuliangduan_nju@126.com
Contribution Title: Energy Source of Superluminous Supernovae			Poster No. 4
54	Tong Liu 刘彤	Xiamen University, China	tongliu@xmu.edu.cn
55	Weiping Liu 柳卫平	China Institute of Atomic Energy, China	wpliu@ciae.ac.cn
Contribution Title: Production of heavy elements in NSM and nuclear physics behind			
56	Yuxin Liu 刘玉鑫	Peking University, China	yxliu@pku.edu.cn
Contribution Title: QCD Phase Transitions & one of their Astronomical Observable			
57	Zhong Liu 刘忠	Institute of Modern Physics, Chinese Academy of Sciences, China	liuzhong@impcas.ac.cn
Contribution Title: Spectroscopy of n-rich Mn isotopes in the N~40 island of inversion and the implication in Urca neutrino cooling in accreted neutron star crust Abstract: Excited states in n-rich $^{63-67}$Mn were studied via in-beam -ray spectroscopy following knockout reactions from ^{68}Fe. Similar level schemes, consisting of the 11/2$^-$, 9/2$^-$, 7/2$^-$ and 5/2$^-$gs level sequence, connected by I→(I-1) transitions, were established, the first time for ^{65,67}Mn. Their level structures show features consistent with strongly-coupled rotational bands with K = 5/2. State-of-the-art shell-model calculations with the modified LNPS effective interaction reproduce the observed levels remarkably well and suggest the dominance of 4-particle-4-hole neutron configurations for all the states. The data on the low-lying excited states of odd-mass $^{53-67}$Mn provide a textbook example of nuclear structure evolution from weak coupling through decoupling to strong coupling along a single isotopic chain on the n-rich side of the β stability line[1]. The results show an enhancement of Urca neutrino cooling in the accreted neutron star crust[2] associated with A = 63 nuclei and rule-out significant cooling from A = 65, 67. This improves constraints that can be made on			

past surface nuclear burning on accreting neutron stars with observed quiescent cooling light curves[3].
References:
[1] X.Y. Liu et al., Physics Letters B 784, 392 (2018)
[2] H. Schatz et al., Nature 505 62 (2014).
[3] Z. Meisel et al., in preparation.

58	Bill Lynch	Michigan State University, USA	lynch@nscl.msu.edu

Contribution Title: Constraints on Neutron Star Crust-core transition and symmetry energy at supra-saturation density
Abstract: The density dependence of the nuclear symmetry energy governs important aspects of very neutron rich systems such as heavy nuclei, neutron stars and their mergers. Many analyses of experimental data have probed the symmetry energy at sub-saturation densities and provided constraints on the symmetry energy and its first derivative at saturation density, ρ_0. Using published constraints on the symmetry energy and its first derivative at ρ_0, we deduce the crust-core transition pressure and density. By combining the neutron star EoS extracted from the GW170817 event and the EoS of symmetric matter from heavy ion collision experiments, we extract the density dependence of the symmetry energy at supra-saturation density.

59	Yugang Ma 马余刚	Fudan University	mayugang@sinap.ac.cn
60	Ben Tal Margalit	University of California at Berkeley, USA	btm2134@columbia.edu

Contribution Title: the more the merrier: multi-messenger science with gravitational waves
Abstract: The first detection of a binary neutron star merger in gravitational waves, GW170817, was additionally observed across the electromagnetic spectrum in the most ambitious follow-up campaign in the history of astronomy. I will discuss ways in which the electromagnetic counterparts of a binary neutron star merger can provide invaluable insight into the merger remnant's fate. Combined with inferred masses from the gravitational wave signal, novel constraints can be placed on the equation of state of dense neutron-rich matter, heralding the dawn of multi-messenger science. I will review major sucesses and lessons from GW170817, and discuss prospects for future multi-messenger detections of binary neutron star mergers.

61	Jérôme Margueron	IPN Lyon, France	j.margueron@ipnl.in2p3.fr

Contribution Title: A critical examination of constraints on the equation of state of dense matter obtained from GW170817
Abstract: The correlation of the tidal polarizabilities Λ_1-Λ_2 for GW170817 is predicted by combining dense-matter equations of state (EOS) that satisfy nuclear physics constraints with the chirp mass and mass asymmetry for this event. Our models are constrained by calculations of the neutron matter EOS using chiral effective field theory Hamiltonians with reliable error estimates up to once or twice the nuclear saturation

density. In the latter case, we find that GW170817 does not improve our understanding of the EOS. We contrast two distinct extrapolations to higher density: a minimal model (MM) which assumes that the EOS is a smooth function of density described by a Taylor expansion and a more general model parameterized by the speed of sound that admits phase transitions. This allows us to identify regions in the Λ_1-Λ_2 plots that could favor the existence of new phases of matter in neutron stars. We predict the combined tidal polarizability of the two neutron stars in GW170817 to be $80\le \tilde{\Lambda}\le 580$ ($280\le \tilde{\Lambda}\le 480$ for the MM), which is smaller than the range suggested by the LIGO-Virgo data analysis. Our analysis also shows that GW170817 requires a NS with $M=1.4M_\odot$ to have a radius $9.0<R_{1.4}<13.6$~km ($ 11.3 <R_{1.4}< 13.6$~km for the MM).			
62	Toshiki Maruyama 丸山敏毅	Japan Atomic Energy Agency, Japan	maruyama.toshiki@jaea.go.jp
Contribution Title: Inhomogeneous structure of mixed phase and the equation of state Abstract: We discuss the properties of nuclear matter at the first-order phase transitions. There are several different phases at different densities some of which are of the first order. Therefore, starting from below the saturation density, nuclear matter should experience at least three times the appearances of mixed phases. The appearance of mixed phase in general softens the EOS of matter. Particularly the kaon condensation and the mixture of hyperons occur at similar densities We report how those two proceed in high-density matter.			
63	Jie Meng 孟杰	Peking University, China	mengj@pku.edu.cn
64	Zhiqiang Miu 缪志强	Xiamen University, China	manuhardy@qq.com
65	Huijun Mu 穆慧君	Xiamen University, China	muhuijun@stu.xmu.edu.cn
66	Nana Pan 潘娜娜	Chongqing University of Posts and Telecommunications, China	pannn@cqupt.edu.cn
67	Chun-Mei Pi 皮春梅	Hubei University of Education, China	pichunmei@hue.edu.cn
68	Eliezer Piasetzky	Tel Aviv University, Israel	eip@tauphy.tau.ac.il
Contribution Title: High Momentum Protons in Nuclei and Neutron Stars Abstract: Electron scattering experiments demonstrate that about 20% of the nucleons in nuclei have momentum greater than the nuclear Fermi momentum. This is predominantly due to close-proximity neutron-proton pairs, which interact via a strong short-range force. I will discuss these close-nucleon in asymmetric nuclei and their importance to the study of neutron stars.			
69	Constança Providência	University of Coimbra, Portugal	cp@fis.uc.pt

Contribution Title: Constraining the nuclear matter equation of state from neutron stars properties Abstract: We examine the constraints set on the nuclear matter equation of state (EoS) by the values of the tidal deformability and neutron star radius, by using a diverse set of relativistic and non-relativistic mean field models consistent with bulk properties of finite nuclei and the observed lower bound on the maximum mass of neutron star ~2 $M_\odot$. The tidal deformability and radius show a strong correlation with specific linear combinations of the isoscalar and isovector nuclear matter parameters associated with the EoS. Such correlations suggest that a precise value of the tidal deformability can put tight bounds on several EoS parameters, in particular, on the slope of the incompressibility and the curvature of the symmetry energy. The tidal deformability obtained from the GW170817 and its UV/optical/infrared counterpart sets the radius of a canonical 1.4 $M_\odot$ neutron star to be $11.82 \leq R_{1.4} \leq 13.72$ km. For core-collapse and neutron star merger simulations it is important to have adequate equations of state, describing the underlying dense and hot matter as realistically as possible. We show that the density dependence of the symmetry energy has a direct influence on the amount of strangeness inside cold and hot dense matter and consequently on thermodynamic quantities, e.g. the temperature for given entropy per baryon. We expect these differences to affect the evolution of a protoneutron star or binary neutron star mergers.			
70	Jie Pu 普洁	Shanghai Jiao Tong University, China	pujiephy@sjtu.edu.cn
Contribution Title: Nuclear matter fourth-order symmetry energy in nonrelativistic mean-field models Abstract: Nuclear matter fourth-order symmetry energy $E_{sym,4}(\rho)$ may significantly influence the properties of neutron stars such as the core-crust transition density and pressure as well as the proton fraction at high densities. The magnitude of $E_{sym,4}(\rho)$ is, however, largely uncertain. Based on systematic analyses of several popular non-relativistic energy density functionals with mean-field approximation, we estimate the value of the $E_{sym,4}(\rho)$ at nuclear normal density ρ_0 and its density dependence, and explore the correlation between $E_{sym,4}(\rho_0)$ and other macroscopic quantities of nuclear matter properties of nuclear matter properties.			Poster No. 5
71	Hiroyuki Sagawa 佐川弘幸	RIKEN Nishina Center/University of Aizu, Japan	hiroyuki.sagawa@gmail.com
Contribution Title: EoS from terrestrial experiments:static and dynamic polarizations of nuclear density			
72	Xinle Shang 尚新乐	Institute of Modern Physics, Chinese Academy of Sciences, China	Shangxinle@impcas.ac.cn
73	Guoyun Shao 邵国运	Xi'an Jiaotong University, China	gyshao@xjtu.edu.cn
74	Lijing Shao 邵立晶	Peking University, China	lshao@pku.edu.cn

Contribution Title: EOSs in gravity tests with GWs Abstract: I will review examples where the gravity tests with gravitational waves depend on the equation of state of neutron stars.			
75	Cuiying Song 宋翠英	Xiamen University, China	cy6201991@163.com
76	Hajime Sotani 祖谷 元	National Astronomical Observatory of Japan, Japan	sotani@yukawa.kyoto-u.ac.jp
Contribution Title: Crustal torsional oscillations and nuclear saturation parameters Abstract: We examine crustal torsional oscillations, newly taking into account the effect of the pasta structure. We find from eigenvalue analyses for various models of the equation of state of uniform nuclear matter that the fundamental frequencies of such oscillations are almost independent of the incompressibility of symmetric nuclear matter (K0), but strongly depend on the slope parameter of the nuclear symmetry energy (L). On the other hand, we also find that the frequencies of the 1st overtones depend strongly on not only L but also K0. By comparing the resultant frequencies to the quasi-periodic oscillations observed in the giant flares, we can constrain the values of L and K0. Furthermore, considering the constraints on K0 obtained from the terrestrial nuclear experiments, we can successfully make a more severe constant on not only L but also the neutron star model for SGR 1806-20.			
77	Baoyuan Sun 孙保元	Lanzhou University, China	sunby@lzu.edu.cn
Contribution Title: Correlated Structure of Nuclear Symmetry Energy from Covariant Nucleon Self-Energy Abstract: Nuclear symmetry energy plays an essential role in understanding the isospin dependent aspects in nuclear physics and the critical issues in astrophysics. Based on the covariant density functional (CDF), both the relativistic mean-field (RMF) and the relativistic Hartree-Fock (RHF) theory have been developed and been utilized to study the symmetry energy and neutron star related physics, and the importance of the Fork diagram on the isospin properties of the in-medium nuclear force has already been illustrated. It is found that in the CDF theory the kinetic part of the symmetry energy is reduced, the fourth-order symmetry energy is suppressed, and the Landau mass are enhanced due to the inclusion of the Fock terms. These results can be related to the nonlocal structure of the nucleon in-medium self-energy demonstrated by the Hugenholtz-Van Hove theorem, and also the effects of nuclear tensor force which is embedded naturally in the Fock diagrams of various meson-nucleon couplings. To discuss the influence of symmetry energy on neutron star physics, a few neutron star properties such as the core-crust transition density, DUrca neutrino emissivity and tidal deformability will be discussed in CDF calculations as well.			
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79	Weiwei Tan 谈伟伟	HuBei University of Education, China	wwtan@nju.edu.cn
80	Hui Tong 童辉	Peking University, China	tongh16@pku.edu.cn

Contribution Title: Neutron drops probed via the Gravitational Waves from GW170817			Poster No. 6
81	Wolfgang Trautmann	GSI Helmholtzzentrum GmbH, Germany	W.Trautmann@gsi.de

Contribution Title: High density with elliptic flows

Abstract: Over the years, the elliptic flow of emitted particles and fragments observed in heavy ion reactions at high energy has become an important observable reflecting the pressure generated in the dense collision zone [1-4]. More recently, information on the nuclear symmetry energy has been deduced from measuring the ratios or differences between the elliptic flows exhibited by neutrons and charged particles in Au+Au collisions at 400 MeV/nucleon at the GSI laboratory [5, 6]. The densities probed in these experiments were shown to reach beyond twice the saturation value [7]. A new source of information on the nuclear equation of state at high density has opened up with the observation of the first LIGO and Virgo GW170817 gravitational wave signal from a neutron star merger [8]. It offers additional possibilities for quantitative comparisons of terrestrial and celestial results [9]. Implications for the applied models and methods will depend on the accuracies that can be achieved. Besides the values of the constraints for the nuclear symmetry energy obtained with the GSI experiments, the known sources of uncertainties and possibilities for their reduction will be discussed [10, 11]. The plans for improved measurements of neutron and proton elliptic flows at FAIR using the NeuLAND and KRAB detectors will be outlined [12].

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82	Betty Tsang	Michigan State University, USA	tsang@nscl.msu.edu

Contribution Title: Confronting Nuclear Equation of state with Gravitational constraint

Abstract: The LIGO-Virgo collaboration's ground-breaking detection of the binary neutron-star merger event, GW170817, has expanded efforts to understand the Equation of State (EoS) of nuclear matter. To relate constraints from nuclear physics to the tidal deformabilities of neutron stars, we construct a neutron star model that accepts input from a

large collection of Skyrme density functions to calculate properties of 1.4 solar-mass neutron stars. In this talk, I'll discuss the effect of the gravitational constraint on the parameters of the Skyrme functions and the relevant laboratory observables that will constrain the EoS at densities relevant to the tidal deformability extracted from GW170817.			
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84	Qin Wang 王琴	Central China Normal University, China	qwang@mail.ccnu.edu.cn
85	Rensheng Wang 王仁生	Soochow University, China	wrs16@suda.edu.cn
86	Yongjia Wang 王永佳	Huzhou University, China	wangyongjia@zjhu.edu.cn
Contribution Title: Fluctuations and correlations in heavy ion collision at intermediate energies Abstract: Fluctuations of the baryon number in relativistic heavy-ion collisions are a promising observable to explore the structure of the QCD phase diagram. The cumulant ratios in heavy-ion collisions at intermediate energies ($\sqrt{s_{NN}}$ < 5 GeV) have not been studied to date. We investigate the effects of mean-field potential and clustering on the cumulant ratios of baryon and proton number distributions in Au+Au collisions at beam energy of 1.23 GeV/nucleon as measured by the HADES Collaboration at GSI. Ultrarelativistic quantum molecular dynamics (UrQMD) and the JAM model are used to calculate the cumulants with different mean-field potentials. It is found that the cumulant ratios are strongly time dependent. At the early stage, the effects of the potentials on the fluctuations of the particle multiplicity in momentum space are relatively weak. The mean fields enhance the fluctuations during the expansion stage, especially for small rapidity acceptance windows. The enhancement of cumulant ratios for free protons is strongly suppressed as compared to that for all baryons. The mean-field potentials and the clustering play an important role for the measured cumulant ratios at intermediate energy.			Poster No. 7
87	Weihua Wang 汪卫华	Central China Normal University, China	wangweihua@mails.ccnu.edu.cn
Contribution Title: Can Cooper pair breaking account for the Crab delayed spin up following its three large glitches? Abstract: Glitch has long been believed to be a probe of neutron star interior physics. In the vortex creep theory, the delayed spin up was interpreted as inward vortex flow. However, this theory contains too much assumptions and can't be calculated from neutron star physics.			Poster No. 8

Here, we propose that the Cooper pair breaking could account for the delayed spin up, this extra positive torque decays exponentially as the chemical departure decays, the delayed spin up timescale is EOS related and thus provide as probe of neutron star physics. Notice that, the Vela pulsar is far too old than the Crab and the superfluid forming has finished long before, which makes its interior structure very different form the Crab pulsar.			
88	Anna L. Watts	University of Amsterdam, Netherlands	A.L.Watts@uva.nl
Contribution Title: Constraining the neutron star Equation of State using pulse profile modelling Abstract: One very promising technique for measuring the dense matter EOS exploits hotspots that form on the neutron star surface due to the pulsar mechanism, accretion streams, or during thermonuclear explosions in the neutron star ocean. I will explain how the pulse profile modelling of hotspots is being used by NICER, an X-ray telescope installed last year on the International Space Station - and why the technique is a mission driver for the next, larger-area generation of telescopes including eXTP.			
89	Jianyan Wei 魏建彦	National Astronomical Observatories, Chinese Academy of Sciences, China	wjy@nao.cas.cn
Contribution Title: Electromagnetic counterparts to gravitational waves: Observation strategy of SVOM satellite			
90	Yunfeng Wei 韦云锋	Xiamen University, China	921328492@qq.com
91	Wei Wei 魏薇	Huazhong Agricultural University, China	weiwei1981@mail.hzau.edu.cn
Contribution Title: Lifting the veil on quark matter in compact stars with core g-mode oscillations			Poster No. 9
92	Dehua Wen 文德华	South China University of Technology, China	wendehua@scut.edu.cn
Contribution Title: GW170817 implications on neutron stars' f-mode oscillation frequency, damping time and their universal scaling relations			Poster No. 10
93	Xuhao Wu 武旭浩	Nankai University, China	1113246566@qq.com
Contribution Title: Quark matter symmetry energy effects on quark-hadron coexistence in neutron star matter Abstract: We examine the effects of the isovector-vector coupling and hypercharge-vector coupling in quark matter on hadron-quark coexistence in neutron star matter. The relativistic mean field theory with the TM1 parameter set and an extended TM1 parameter set are			Poster No. 11

used to describe hadronic matter, and the Nambu-Jona-Lasinio model with scalar, isoscalar-vector, isovector-vector and hypercharg-evector couplings is used to describe deconfined quark matter. The hadron-quark phase transition is constructed via the Gibbs conditions for phase equilibrium. The isovector-vector and hypercharge- vector couplings in quark matter enhance the symmetry energy and hypercharge symmetry energy in neutron star matter, while their effects are found to be suppressed at high densities by the strange quarks. As a result, the hadron-quark mixed phase shrinks with only isovector-vector coupling and moves to higher density with isovector-vector and hypercharge-vector couplings.			
94	Cheng-Jun Xia 夏铖君	Ningbo Institute of Technology, Zhejiang University, China	cjxia@nit.zju.edu.cn
Contribution Title: Interface effects of strange quark matter Abstract: We study the interface effects in strangelets adopting mean-field approximation (MFA). Based on an equivparticle model, the linear confinement and leading-order perturbative interactions are included with density-dependent quark masses. By increasing the confinement strength, the surface tension and curvature term of strange quark matter (SQM) become larger, while the perturbative interaction does the opposite. For those parameters constrained according to the 2$M_\odot$ strange star, the surface tension is $\sim$2.4 MeV/fm^2, while unstable SQM indicates a slightly larger surface tension. The obtained results are then compared with those predicted by the multiple reflection expansion (MRE) method. In contrast to the bag model case, it is found that MRE method overestimates the surface tension and underestimates the curvature term. To reproduce our results, the density of states in the MRE approach should be modified by proper damping factors.			
95	Zhigang Xiao 肖志刚	Tsinghua University, China	Xiaozg@tsinghua.edu.cn
Contribution Title: Experimental studies on the isospin transport and the asymmetric nuclear equation of state in heavy ion collisions Abstract: The nuclear symmetry energy varying with density is a key input to understand the isospin dynamics in heavy ion collisions (HIC) as well as the evolution properties of dense stellar object. We study the isospin transport in heavy ion to seek an experimental constraint of the density dependence of the symmetry energy. In this talk, I will present some recent results of our researches, 1) An isospin dependent hierarchy of particle emission is observed, suggesting that the relaxation of isospin degree of freedom in heavy ion collisions may not be so fast as what we have learnt for experience. 2) Further, the angular dependence of the neutron richness of the produced light charged particles is measured, allowing us to constrain stringently the nuclear symmetry energy below saturation density. 3) The isovector re-orientation effect of deuteron scattering off a heavy target is demonstrated to be a clean and sensitive probe of the symmetry energy at subsaturation densities. 3) Progress on the experimental measurement of the small angle correlation of particle pairs with different N/Z will be presented.			

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97	Jun Xu 徐骏	Shanghai Institute of Applied Physics, Chinese Academy of Sciences, China	xujun@sinap.ac.cn
98	Renxin Xu 徐仁新	Peking University, China	r.x.xu@pku.edu.cn
Contribution Title: A strangeon idea tested by GW170817 Abstract: It is generally thought that strangeness would play an important role in understanding the state of bulk strong matter, and that the unknown state could be the first big problem to be solved in the era of gravitational-wave astronomy. Normal nuclei inside atoms are 2-flavored (constituent: nucleon), but we propose that bulk strong matter could be 3-flavored (constituent: strangeon). Strangeon matter is manifested in the form of compact stars, cosmic rays, and even dark matter, as will be explained in this talk.			
99	Yan Xu 许妍	Changchun Observatory, National Astronomical Observatories, Chinese Academy of Sciences, China	xuy@cho.ac.cn
Contribution Title: Nucleon 1S0 superfluidity in neutron star matter Abstract: The properties of neutron and proton singlet superfluidity are studied by taking the effects of antikaon condensations into account in neutron star matter.It is found that antikaon condensations lead to a strong suppression of the neutron singlet superfluidity and an obvious enhancement of the proton singlet superfluidity in neutron star matter.In particular, the neutron and proton singlet pairing gaps are gradually shrinking with the optical potential of antikaons from-80 to -130 MeV. Antikaon condensations have been markedly downsized the proton singlet superfluid range as the deepening of the optical potential of antikaons in neutron star matter.We also found that antikaon condensations only occur in the PSR J1614-2230 and PSR J0348+0432 when the range of optical potential of antikaons is from -100 to -130 MeV.			Poster No. 12
100	Yan Yan 严妍	Changzhou University, China	2919ywhhxh@163.com
101	Kun Yang 杨昆	Xingyi Normal University for Nationalities, China	yangkun209@mails.ucas.ac.cn
Contribution Title: Light Clusters Production as a Probe to the Density Dependence of the Symmetry Energy Abstract: Measurements of light charged particles and intermediate mass fragments emission from 64Zn + 112Sn reactions at 40 AMeV have been completed at the TAMU K500 Superconducting Cyclotron Laboratory, in order to probe the density dependence of the symmetry energy. By comparing the experimental data with the AMD transport			Poster No. 13

model and GEMINI statistical decay model predictions, a possible behavior of symmetry energy was indicating, although with a considerable statistical uncertainty.			
102	Nobutoshi Yasutake 安武伸俊	Chiba Institute of Technology, Japan	nobutoshi.yasutake@p.chibakoudai.jp
Contribution Title: Quark-hadron pasta in neutron stars: A quick guide for EOS table Abstract: Pasta structures are studied in the quark-hadron phase transition, where the hadron model is based on the nonlinear Walecka-type model, and the quark model is formulated with the quasi-particle model. The detectability by astrophysical observations is also discussed in the presentation. We hope fruitful discussion and comments through this conference.			
103	Tuan Yi 伊团	Xiamen University, China	19820141152952@stu.xmu.edu.cn
104	Gao-Chan Yong 雍高产	Institute of Modern Physics, Chinese Academy of Sciences, China	yonggaochan@impcas.ac.cn
105	Xiaodi Yu 余小弟		
106	Yunwei Yu 俞云伟	Central China Normal University, China	yuyw@mail.ccnu.edu.cn
Contribution Title: Transient emission associated with the birth of neutron stars			
107	Jianping Yuan 袁建平	Xinjiang Astronomical Observatory, Chinese Academy of Sciences, China	yuanjp@xao.ac.cn
Contribution Title: Correlation between glitch and emission Abstract: Researches recently revealed that the variations of emission from a few pulsars are correlated with their rotations. The spin-down rates of intermittent pulsars are higher when they are on active mode, that than when they are on inactive mode. The timing noises in six pulsars are correlated with the changes in the pulse shapes. Moreover, variations of emission from four pulsars are observed to associate with their glitches. All these evidences suggest that the activities of magnetosphere are linked to the pulsar rotations. We will review the observational features of glitches, including the post-glitch behavior. We report the interactive between variation of emission and spin-down in PSR B2035+36. Such researches help to understand the physics of pulsar internal and pulsar magnetosphere, the interactivities between internal and magnetosphere.			
108	Binbin Zhang 张彬彬	Nanjing University, China	bbzhang@nju.edu.cn
109	Bing Zhang 张冰	UNLV, USA/NAOC&PKU, China	zhang@physics.unlv.edu
Contribution Title: Equation of state from EM counterparts of GWs			

110	Guoqiang Zhang 张国强	Shanghai Institute of Applied Physics, Chinese Academy of Sciences, China	zhangguoqiang@sinap.ac.cn
Contribution Title: Nuclear Astrophysics Induced by Laser Abstract: With the development of the techniques of laser, the extreme environments that exist only in the center of stars can be created directly by the super intensive laser on a table top in the laboratory. I will give a talk on Nuclear Astrophysics Induced by Laser. The nuclear fusion and r-process are taken as examples of the application.			
111	Naibo Zhang 张乃波	Shandong University at Weihai, China	naibozhang@sdu.edu.cn
Contribution Title: Delineating effects of nuclear symmetry energy on the radii and tidal polarizabilities of neutron stars Abstract: What can we learn about the density dependence of nuclear symmetry energy $E_{sym}(r)$ from precise measurements of the radius ($R_{1.4}$) and/or tidal polarizability ($\Lambda_{1.4}$) of canonical neutron stars with a mass of 1.4 M_{sun}? With the $E_{sym}(r)$ parameterized using three parameters L, K_{sym}, and J_{sym}, we found that, while both the $R_{1.4}$ and $\Lambda_{1.4}$ depend strongly on the slope L, the K_{sym} and J_{sym} parameters characterizing the high-density behavior of $E_{sym}(\rho)$ also play appreciable roles. Precise measurements of just the $\Lambda_{1.4}$ and $R_{1.4}$ cannot completely determine the $E_{sym}(\rho)$ but limit combinations of its parameters. In particular, stringent constraints approximately independent of the J_{sym} on the L–K_{sym} correlations can be obtained. However, infinite combinations of the larger (smaller) L and smaller (larger) K_{sym} can lead to the same $\Lambda_{1.4}$ and $R_{1.4}$. Additional observables including those from terrestrial nuclear experiments are thus necessary to break this degeneracy in order to completely determine the density dependence of nuclear symmetry energy $E_{sym}(\rho)$.			
112	Shisheng Zhang 张时声	Beihang University, China	zss76@buaa.edu.cn
Contribution Title: Microscopic Study on Halo Nuclei			Poster No. 14
113	Shuang-Nan Zhang 张双南	Institute of High Energy Physics, Chinese Academy of Sciences, China	zhangsn@ihep.ac.cn
Contribution Title: Results of Insight-HXMT observations on neutron stars and stellar mass black holes Abstract: Insight-HXMT is China's first X-ray astronomy satellite launched on June 15, 2017. I will review the results of Insight-HXMT observations on neutron stars and stellar mass black holes, including isolated pulsars, accretion neutron stars and black holes.			
114	Qijun Zhi 支启军	Guizhou Normal University, China	qjzhi@gznu.edu.cn
115	Enping Zhou 周恩平	Max-planck institute for gravitational physics, Germany	enping.zhou@aei.mpg.de
Contribution Title: Differential rotating quark stars with realistic angular velocity profile Abstract: Important clues on the equation of state of compact stars might be revealed in the			

multi-messenger observation of BNS mergers. On one hand, the tidal deformability which encodes information about the radius of compact stars, can be obtained in the gravitational wave observation in the inspiral phase. On the other hand, the evolution of the remnant supra/hyper-massive compact star, which is tightly related to the maximum mass and rotational configuration of the remnant object, could be inferred from both gravitational wave observation and electro-magnetic counterparts. In order to understand the evolution of such a remnant compact star, which could possibly be a quark star, we have constructed differential rotating solutions for quark stars. And for the first time, we have applied a rotation profile which is similar to the ones that are found in the remnant hypermassive compact stars produced in numerical relativity simulations, to help better understand the structure and possible behavior of it.			
116	Xia Zhou 周霞	Xinjiang Astronomical Observatory, Chinese Academy of Sciences, China	zhouxia@xao.ac.cn
Contribution Title: R-mode instability in compact stars Abstract: A hypothetical detection of r-mode gravitational radiation from rotating compact stars could have at least three major implications in our understanding of compact stars: (i) set constraints on the equation of state of dense matter in the core of the compact star, and (ii) set upper bounds on α and settle the debate about the magnitude of the saturation amplitude of the r-mode oscillations on compact stars. In this tall, I will introduce our recent works about the r-mode instability in compact stars and the astrophysical constraints on it.			
117	Ying Zhou 周颖	Shanghai Jiao Tong University, China	yingchow@sjtu.edu.cn
Contribution Title: Effects of fourth-order symmetry energy on the R-mode instability of neutron stars Abstract: Based on the phenomenological momentum-independent MID model, we constructed a series of MID EOSs with only different fourth-order symmetry energy $E_{sym,4}(n)$. Due to the change of transition density of nuclear matter, we check the effect of $E_{sym,4}(n)$ on the R-mode instability of neutron stars.			Poster No. 15
118	Jin-Ping Zhu 朱锦平	Peking University, China	zhujp@pku.edu.cn