

# Summary

# Closing remarks

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This meeting started with a bang, with the announcement of what appears to be another 'Lorimer burst'. Two more 'diamond planets', white dwarf binary companions made of crystalline carbon, quickly followed. This drama in the first session gave way to numerous interesting, surprising results. We still have not found a pulsar orbiting a black hole, but we do have the first triple system with the pulsar in the inner binary and a main sequence star forming the outer part of the binary; it may allow tests of the Equivalence Principle. Another close binary may allow checking for dipolar gravitational radiation. Work on the spin-up of millisecond pulsars is better determining the mass accreted during the spin-up and more sophisticated determination of their ages. Indications of more high mass ( $\sim 2 M_{\odot}$ ) pulsars will allow constraints to be placed on the Equation of State for a neutron star. As was remarked, 'We keep finding cool new pulsars wherever we look!'; Duncan Lorimer predicted we would know of 4000 pulsars by 2020, a doubling of the present number.

The 'empty' space in the P - P-dot diagram between the magnetars and 'normal' stars is being populated and the 'missing link' with low mass X-ray binaries is being filled in (along with a welcome magnetic field measurement from an X-ray cyclotron line). The Fermi satellite continues to be a rich source of new gamma ray pulsars, with a large fraction of them apparently radio quiet. The number of RRATs continues to grow, with consequent problems for the size of the total neutron star population; we now see that RRAT is a detection classification, not a separate population and that there must be an evolutionary linkage (yet to be revealed) between several groups of pulsars.

One of the striking developments in pulsar astrophysics over the last few years has been the discovery of the richness in timing noise. P-dot changes, nulling, mode-switching and polarization changes are found to be linked - at least in the stronger pulsars with the largest timing noise. 'Magnetospheric switching' is the new buzz phrase; it has memory and is surprisingly repeatable! To my mind it is another surprising factor to be added to an already complicated environment!

We are indebted to the many who have contributed to the success of this meeting; I recognize the presenters of the 75 oral papers, the similar number of lead authors on posters, the SOC, and other key figures thus†:

† Footage: <http://www.pulsarastronomy.net/IAUS291/video/JocelynBellBurnell/>

## A pulsar sound poem

<b>Manchester, Buchner, Weber, Wang</b>	<i>(At a steady pace)</i>	
<b>Shibata, Gupta, Dembska, Tang</b>		
<b>Possenti, Kaspi, Lee and Li.</b>		
<b>Romani, Ransom, Özel, Rea</b>		
<b>McLaughlin, Kramer, Jenet, Nice</b>		
<b>Van Leeuwen, Shannon, Coenen Thijs,</b>		
<b>Camero, Melrose, Lyne and Dyks</b>		
<b>Spitkovsky, Seymour, Seo, Xie</b>		
<b>Hick</b>		<i>glitch and</i>
<b>Aris, Ellis, Cordes, Bailes</b>	<i>(faster then</i>	<i>mode change</i>
<b>Tauris, Lassus, Heras, Surnis</b>	<i>slowing to</i>	
<b>Roberts, Stappers, Hobbs and Flores,</b>	<i>original pace)</i>	
<b>Falcke, Freire, Ferrand, Zane</b>		
<b>Malov, Pavlov, Oskinova,</b>		
<b>Wada, Na and Espinoza.</b>		
<b>Smirnova, Yan, Petrova, Han</b>		<i>mode change</i>
<b>Kohmura, Wu, Kameya, Yu</b>		
<b>Kojima, Du, Fantina, Zhu</b>		
<b>Tanaka, Xu, Urama too!</b>		
<b>Karako, Zhang, Dall’Osso, Yang</b>		
<b>Van Haaften, Lynch, Kholtygin, Lin,</b>		
<b>Lorimer, Qiao, Hanbarayan, Aoki, Yuen, Igoshev,</b>	<i>(quietly, no</i>	<i>pulse nulling</i>
<b>Zhou, Serylak, Cui, Chattopadhyay, Gao,</b>	<i>rhythm)</i>	
<b>Camero-Arranz, Yuan, Huang, Lazarus, .....</b>		<i>end of null</i>
<b>Van den Heuvel, Ali Alpar</b>	<i>(loud with</i>	<i>mode change</i>
<b>Kerr and Keene and Keith and Kirk</b>	<i>beat)</i>	
<b>Cherry Ng, and Reisenegger</b>		
<b>Siemion, Chamel, Guillemot, Sumiyoshi,</b>	<i>(quietly, no</i>	<i>pulse null</i>
<b>Saz-Parkinson, Belfiore, Burke-Spolaor,</b>	<i>rhythm)</i>	
<b>Rubio-Herrera, Degenaar, D’Angelo,</b>		
<b>Andersson, J-P, Karastergiou, Liu, Poutanen,</b>		
<b>Desvignes, Safi-Harb, Chatterjee, Majid,</b>		
<b>Chanaangalam</b>		<i>end of null</i>

**Barnah, Kumar, Gajjar, Dai** (loud with

**Johnston, Joshi, Shao, Lai** beat)

**Feynman, Einstein, Hulse and Taylor**

**Baade, Zwicky, Volkoff, Tolman**

**Oppenh-**

eimer, Kondratiev, Gusev, Wex, (quietly, no *pulse null*

van Kerkwijk, Scholz, Palucci, Pavlovskii rhythm)

Ho, Timokhin, Eatough, Deng, Riles, Yue,

Stepanov, Tendulkar, Kisaka, Gentile, Török,

Tong, Ulyanov, Zhen *end of null*

**What an utter, mutter, nutter!** (slowly)

*Wheeeuw* (descending whistle) *dispersion*

Bonk

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Thanks to the Organising Committees for such an excellent programme, and to the speakers and participants for making it such an interesting and enjoyable event. I was particularly grateful to our three Plenary speakers; sitting amongst the large audience of astronomers rather less familiar than us with pulsars, it was very satisfying to hear the amazed gasps as they appreciated the accuracy with which pulsar periods are measured and the consequences for physics of having such data. Thanks to all who welcomed us to China and smoothed our paths and special thanks to the conference volunteers, the orange-shirted students, who have been so helpful in ensuring everything went smoothly.

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