

Visions and Voices and the USC Libraries have collaborated to create a series of resource guides that allow you to build on your experiences at many Visions and Voices events. Explore the resources listed below and continue your journey of inquiry and discovery!

Einstein's Cosmic Messengers

USC LIBRARIES RESOURCE GUIDE

EVENT DATE: October 22, 2010

Music and science coalesce in *Einstein's Cosmic Messengers*, a stunning multimedia concert created by composer Andrea Centazzo and NASA physicist Michele Vallisneri. Following this magnificent journey through the universe, science writer K.C. Cole will moderate a conversation with Centazzo, Vallisneri and USC cosmology professor Elena Pierpaoli.

SARA R. TOMPSON of the **USC LIBRARIES** has selected the following resources to help you learn more about Einstein and the event's participants. Please visit the online version of this guide at libguides.usc.edu/cosmic for much more, including videos and links to audio compositions by Centazzo.

Gravitational Waves Defined

The news site *Science Daily* defines a gravitational wave as: "a fluctuation in the curvature of space-time which propagates as a wave, traveling outward from a moving object or system of objects." The article goes on to note: "Gravitational radiation is the energy transported by these waves. Important examples of systems which emit gravitational waves are binary star systems, where the two stars in the binary are white dwarfs, neutron stars or black holes. Although gravitational radiation has not yet been directly detected, it has been indirectly shown to exist."

The *Universe Today* blog noted in 2008: "Gravitational waves are predicted by Einstein's 1916 General Theory of Relativity, but they are notoriously hard to detect and it's taken many decades to come close to observing them."

Selected Related Books

Relativity: The Special and the General Theory

By Albert Einstein

Science & Engineering Library QC173.55.E384513 2006

Traveling at the Speed of Thought: Einstein and the Quest for Gravitational Waves

By Daniel Kenniffick

Doheny Memorial Library QC179.K46 2007x

Gravitational Waves. Vol. 1, Theory and Experiments

By Michele Maggiore

Science & Engineering Library QC179.M34 2008

Mind over Matter: Conversations with the Cosmos

By K.C. Cole

Doheny Memorial Library Q162.C584 2003

The Hole in the Universe: How Scientists Peered over the Edge of Emptiness and Found Everything

By K.C. Cole

Leavey Library QC6.C62 2001

Selected Articles

Note that some of the article citations below include the DOI (Digital Object Identifier) links. DOIs are stable URLs assigned by publishers. They are a good way to get right to an article (if USC subscribes to the journal) or to the abstract (if we do not). All of these citations were found cited in the Inspec Database, to which USC subscribes on the Engineering Village 2 platform. Thanks to Emily Ross, civil engineering major and student assistant for the USC Libraries' associate deans, for help with research in this section.

Selected Works by Michele Vallisneri

- "The Mock LISA Data Challenges: from challenge 3 to challenge 4." Babak, S., et al., incl. Vallisneri. [A physics collaboration-authored work.] *Classical and Quantum Gravity*, v 27, n 8, p 084009 (12 pp.), 21 April 2010.
<http://dx.doi.org/10.1088/0264-9381/27/8/084009>
- "A LISA data-analysis primer." Vallisneri, M. *Classical and Quantum Gravity*, v 26, n 9, p 094024 (12 pp.), 7 May 2009.
<http://dx.doi.org/10.1103/PhysRevD.81.024004>
- "Search of S3 LIGO data for gravitational wave signals from spinning black hole and neutron star binary in spirals." Abbott, B. (LIGO, California Inst. of Technol., Pasadena, CA, USA), et al., incl. Vallisneri. [A physics collaboration-authored work.] *Physical Review D*, v 78, n 4, p 042002-1-19, 15 Aug. 2008.
<http://dx.doi.org/10.1103/PhysRevD.78.042002>
- "Sensitivity and parameter-estimation precision for alternate LISA configurations." Vallisneri, M.; Crowder, J.; Tinto, M. *Classical and Quantum Gravity*, v 25, n 6, p 065005-1-17, 21 March 2008.
<http://dx.doi.org/10.1088/0264-9381/25/6/065005>
- "Search for gravitational waves associated with 39 gamma-ray bursts using data from the second, third, and fourth LIGO runs." Abbott, B. (LIGO, California Inst. of Technol., Pasadena, CA, USA), et al., incl. Vallisneri. [A physics collaboration-authored work.] *Physical Review D*, v 77, n 6, p 062004-1-22, 15 March 2008.
<http://dx.doi.org/10.1103/PhysRevD.77.062004>

Selected Works by Elena Pierpaoli

- "Optical Design of the EPIC-IM Crossed Dragone Telescope." Huan Tran, et al., incl. Pierpaoli. [A physics collaboration-authored work.]. *Proceedings of the SPIE - The International Society for Optical Engineering*, v 7731, p 77311R (15 pp.), 2010.
<http://dx.doi.org/10.1117/12.857423>
- "Effects of dark matter decay and annihilation on the high-redshift 21 cm background." Furlanetto, S.R.; Oh, S.P.; Pierpaoli, E. *Physical Review D*, v 74, n 10, p 103502-1-15, 15 Nov. 2006.
<http://dx.doi.org/10.1103/PhysRevD.74.103502>
- "New cosmic microwave background constraint to primordial gravitational waves." Smith, T.L.; Pierpaoli, E.; Kamionkowski, M. *Physical Review Letters*, v 97, n 2, p 021301/1-4, 14 July 2006.
<http://dx.doi.org/10.1103/PhysRevLett.97.021301>
- "Impact of dark matter decays and annihilations on reionization." Mapelli, M.; Ferrara, A.; Pierpaoli, E. *Monthly Notices of the Royal Astronomical Society*, v 396, n 4, p 1719-24, 11 July 2006.
<http://dx.doi.org/10.1111/j.1365-2966.2006.10408.x>
- "Probing the largest scale structure in the Universe with polarization map of galaxy clusters." Seto, N.; Pierpaoli, E. *Physical Review Letters*, v 95, n 10, p 101302/1-4, 2 Sept. 2005.
<http://dx.doi.org/10.1103/PhysRevLett.95.101302>