Geology

Recent Findings from China University of Geosciences Provides New Insights into Geology (Structural relationships along a Neoarchean arc-continent collision zone, North China craton)

2017 FEB 3 (NewsRx) -- By a News Reporter-Staff News Editor at Science Letter -- Investigators discuss new findings in Geology. According to news reporting out of Wuhan, People's Republic of China, by NewsRx editors, research stated, "The Archean North China craton is composed of the Western block, Eastern block, and the intervening Central orogenic belt. A 4-10-km-wide and 85-km-long tectonic melange belt informally called the Zanhuang tectonic melange is documented in the Zanhuang Massif of the Central orogenic belt, separating the Eastern block from an Archean arc terrane in the Central orogenic belt."

Our news journalists obtained a quote from the research from the China University of Geosciences, "The - melange belt contains a structurally complex tectonic mixture of metapelites, metapsammites, marbles, and quartzites mixed with exotic tectonic blocks of volcanic, mafic, and ultramafic rocks, metabasalts that locally include relict pillow structures, and tonalite-trondhjemite- granodiorite (TTG) gneisses. The Zanhuang tectonic melange marks the suture of an arc-continent collisional zone between the Western Zanhuang Massif in the Central orogenic belt and the Eastern block of the North China craton, and it is one of the best-preserved Archean tectonic melanges in the world. Here, using zircon U-Pb dating of various types of blocks from the Zanhuang melange, we show that the formation and associated deformation of the Zanhuang - melange occurred in the Neoarchean (ca. 2.5 Ga). High-precision (1: 20-1: 200) lithostructural mapping of three key outcrops reveals details of the internal fabrics and kinematics of the melange and regional structural relationships along the arc-continent collisional zone. A synthesis of studies on the tectonic evolution of the North China craton, coupled with our new fabric and kinematic analysis of the Zanhuang melange, further constrains the initial amalgamation timing and geometry of the arc-continent collision between the Fuping arc terrane in the Central orogenic belt and the Eastern block with a northwest- dipping subduction polarity. The asymmetric structures and mixture of different blocks and matrices with folding and thrusting events in the Zanhuang melange record kinematic information that is consistent with the tectonic setting of an accretionary wedge that was thrust over the passive margin of the Eastern block by 2.5 Ga."

According to the news editors, the research concluded: "Lithostructural mapping shows that the classic melange and fold-and-thrust structures along the Neoarchean arc-continent collisional zone are broadly similar to Phanerozoic collisional belts."

For more information on this research see: Structural relationships along a Neoarchean arc-continent collision zone, North China craton. *Geological Society of America Bulletin*, 2017;129(1-2):59-75. *Geological Society of America Bulletin* can be contacted at: Geological Soc Amer, Inc, PO Box 9140, Boulder, CO 80301-9140, USA.

Our news journalists report that additional information may be obtained by contacting T. Kusky, China Univ Geosci, Three Gorges Res Center Geohazards, Wuhan 430074, People's Republic of China. Additional authors for this research include T. Kusky, L. Wang, A. Polat, H. Deng, C. Wang and S.J. Wang.

The direct object identifier (DOI) for that additional information is: http://dx.doi.org/10.1130/B31479.1. This DOI is a link to an online electronic document that is either free or for purchase.

Keywords for this news article include: Wuhan, People's Republic of China, Asia, Geology, China, Asia, China University of Geosciences.

Science

Recent Findings from Michigan Technological University Provides New Insights into Science (Nonreciprocal Transverse Photonic Spin and Magnetization-Induced Electromagnetic Spin-Orbit Coupling)

2017 FEB 3 (NewsRx) -- By a News Reporter-Staff News Editor at Science Letter -- Current study results on Science have been published. According to news reporting from Houghton, Michigan, by NewsRx journalists, research stated, "We present a formulation of electromagnetic spin-orbit coupling in magneto-optic media, and propose an alternative source of spin-orbit coupling to non-paraxial optics vortices. Our treatment puts forth a formulation of nonreciprocal transverse-spin angular-momentum-density shifts for evanescent waves in magneto-optic waveguide media."

The news correspondents obtained a quote from the research from Michigan Technological University, "It shows that magnetization-induced electromagnetic spin-orbit coupling is possible, and that it leads to unequal spin to orbital angular momentum conversion in magneto-optic media evanescent waves in opposite propagation-directions. Generation of free-space helicoidal beams based on this conversion is shown to be spin-helicity- and magnetization-dependent. We show that transverse-spin to orbital angular momentum coupling into magneto-optic waveguide media engenders spin-helicity-dependent unidirectional propagation."

According to the news reporters, the research concluded: "This unidirectional effect produces different orbital angular momenta in opposite directions upon excitation-spin-helicity reversals."

For more information on this research see: Nonreciprocal Transverse Photonic Spin and Magnetization-Induced Electromagnetic Spin-Orbit Coupling. *Scientific Reports*, 2017;7 ():1-8. *Scientific Reports* can be contacted at: Nature Publishing Group, Macmillan Building, 4 Crinan St, London N1 9XW, England. (Nature Publishing Group - www.nature.com/; Scientific Reports - www.nature.com/srep/)

Our news journalists report that additional information may be obtained by contacting M. Levy, Michigan Technological University, Dept. of Phys, Houghton, MI 49931, United States.

Keywords for this news article include: Houghton, Michigan, United States, North and Central America, Science, Magneto-optics, Electronics, Michigan Technological University.