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More than doubled ambient superconducting transition in a heavily compressed aromatic hydrocarbon[1] XIAO-JIA CHEN, TAKAKI MURAMATSU, WENGE YANG, VIKTOR STRUZHKIN STRUZHKIN, HO-KWANG MAO, Geophysical Laboratory, Carnegie Institution of Washington, Washington, DC 20015, QINGZHEN HUANG, NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD 20899, ZHEN-XING QIN, Department of Physics, South China University of Technology, Guangzhou 510640, China, X.F. WANG, J.J. YING, P. CHENG, Z.J. XIANG, X.H. CHEN, Hefei Natl Lab for Physical Science at Microscale and Department of Physics, University of Science and Technology of China, Hefei, Anhui 230026, China — Exploring superconductivity at higher transition temperatures T_cs in light elements such as hydrogen and carbon and their organic compounds has long been an attractive issue. Cation-doped aromatic hydrocarbons have been discovered to be superconductive with an increasing T_c by adding more hydrocarbon rings. Here we present a discovery of an enhancement of T_c from the ambient 4.8 K to 12.2 K in compressed $\mathrm{Ba}_{1.5}$Phenanthrene by magnetic susceptibility measurements up to 61 GPa. In contrast to the existence of superconductivity within a very narrow pressure range in fullerides, we find that this organic compound maintains superconductivity at more than doubled ambient T_c even at 61 GPa. A phase transition in the region between 3.0 and 5.4 GPa and an orientational disorder at around 28 GPa are identified using synchrotron X-ray diffraction technique. A nice correction between T_c and the angle between two crystal axes indicates the essential role of electronic correlations.

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Xiao-Jia Chen
Geophysical Laboratory, Carnegie Institution of Washington,
Washington, DC 20015

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