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High-pressure spectroscopic studies on solid germane[1] XIAOJIA CHEN, VIKTOR V. STRUZHKIN, ZHEN-XIAN LIU, MUHETAER AIHAITI, YUE MENG, HO-KWANG MAO, RUSSELL J. HEMLEY, Carnegie Institution of Washington,Washington, DC 20015, CHAO ZHANG, RUI-QIN ZHANG, City University of Hong Kong, Kowloon, Hong Kong, YANLING LI, HAI-QING LIN, The Chinese University of Hong Kong, Shatin, Hong Kong — We performed extensive spectroscopic studies on dense germane up to 110 GPa. Pressure – temperature phase diagram has been established from Raman and infrared spectra. There is no any trace of decomposition of Ge and H_2 over the pressure range studied. Infrared measurements provide spectroscopic evidence of the metallization of this material at pressure around 16 GPa which is much lower than that observed in sister system - silane. Angle-dispersive powder x-ray diffraction studies reveal that only a structural transition is accompanying when germane enters its metallic state. These experimental observations are examined by *ab initio* calculations. The theoretical results of the electronic, lattice dynamical, and superconducting properties of metallic phase of this material are also presented.

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