Objective:
• Design nanowires that memorize being stretched/compressed by switching between metallic and magnetic behavior.

Approach:
• *Ab initio* quantum chemical calculations yield equilibrium atomic positions and determine if nanowires are metallic or magnetic.

Significant Results:
• Due to their unique structure, Mo$_{12}$S$_9$I$_9$ nanowires can be reversibly stretched/compressed by up to 20% and retain their new shape.
• This property can be utilized to construct unique mechanical strain sensors.

• Teng Yang, Shinya Okano, Savas Berber, and David Tománek, Interplay between structure and magnetism in Mo$_{12}$S$_9$I$_9$ nanowires, Phys. Rev. Lett. 96, 125502 (2006).