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Title of the Presentation: Two-Dimensional (2D) Transition Metal Dichalcogenide (TMDCs) and One-Dimensional (1D) Transition Metal Chalcogenides (TMCs)

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Short Biography:

Taishi Takenobu received his Ph.D. (materials science) from Japan Advanced Institute of Science and Technology (JAIST) in 2001. Since April 2001, he has worked in SONY corporation. From December 2001, he was assistant and associate professor of Tohoku University. From 2010, he was associate professor and professor of Waseda University, and, from March 2016, he is currently a professor of Nagoya University. His current research interests include (1) realization of electrical driven organic laser devise, (2) flexible, stretchable and printable electronics based on organic and nano materials, and (3) solid state physics and functional devices of TMDC monolayer and TMC wire.

Abstract:

The development of bulk synthetic processes to prepare functional nanomaterials is crucial to achieve progress in fundamental and applied science. Transition-metal chalcogenide (TMC) nanowires, which are one-dimensional (1D) structures having three-atom diameters and van der Waals surfaces, have been reported to possess a 1D metallic nature with great potential in electronics and energy devices [1-6]. However, their mass production remains challenging.

Recently, we demonstrated a wafer-scale synthesis of highly crystalline transition-metal telluride nanowires by chemical vapor deposition [7]. The present technique enables formation of either aligned, atomically thin two-dimensional (2D) sheets or random networks of three-dimensional (3D) bundles, both composed of individual nanowires. Particularly, the carrier transport properties of 2D sheets revealed the Shubnikov–de Haas oscillation, which suggests the formation of 2D carrier gas within laterally-assembled TMC atomic wires.

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