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Two-Dimensional Materials and Their Exotic Electronic Properties

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Deadline for manuscript submissions:
closed (20 August 2022)

Message from the Guest Editors

Since the discovery of graphene in 2004, two-dimensional (2D) materials have become one of the largest research fields in the scientific community. This is not only due to their intriguing fundamental physical properties, including magnetism, topology, superconductivity, etc., but also their potential applications in catalysts, ferroelectricity, spintronics, valleytronics, twistronics, etc.

However, large-area synthesis, defect and interface interference, delamination and peeling, etc. are remaining bottlenecks for widespread applications of 2D materials. Beyond the widely studied graphene and transition metal dichalcogenides (TMDs), few kinds of 2D materials have been discovered, including dielectride, MXenes, covalent organic frameworks (COFs), BiOX, etc. High throughput calculations combined with materials informatics accelerates the discovery of new 2D materials.

The aim of this SI is to introduce the current progress of 2D materials, to explore more 2D materials with exotic electronic properties, and to further promote the potential applications of devices based on 2D materials.

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Message from the Editor-in-Chief

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Journal Rank: JCR - Q2 (*Metallurgy & Metallurgical Engineering*) / CiteScore - Q2 (*Condensed Matter Physics*)

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