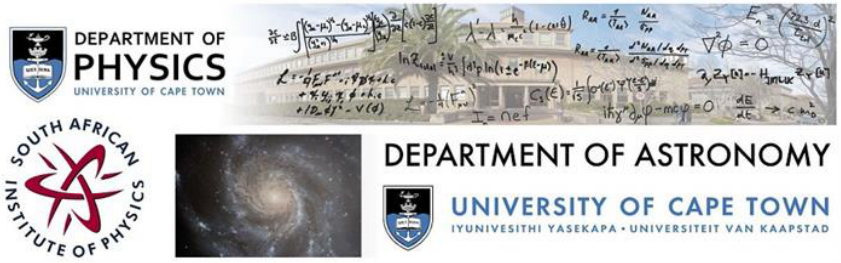

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The Bottom-up synthesis and characterization of molybdenum dichalcogenide nanomaterials for applications in supercapacitors

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Abstract content
   (Max 300 words)
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The 2D atomic crystals of molybdenum dichalcogenides such MoS2 and MoSe2 have attracted much interest in the scientific community due to their unique properties. The 2D atomic crystals or nanosheets of the molybdenum dichalcogenides have excellent electrical and optoelectronic properties that make them good candidates for use in certain applications such as energy conversion devices, chemical sensors and catalysis. Molybdenum dichalcogenide nanosheets have traditionally been synthesized using methods such as mechanical exfoliation, liquid exfoliation and chemical vapor deposition. These methods are difficult to scale up due to their high temperature requirements, tedious procedures and require complex apparatus. In this project bottom-up chemical synthetic methods are used for the production of MoS2 and MoSe2 nanomaterials. These methods have attracted a lot of interest because they provide a way of making these materials at low temperature with relatively simple procedures that can be scaled up easily and allow for the control of the size and thickness of the materials. These methods have also resulted in interesting morphologies such as nanorods and nanoflowers which are also being investigated in this project. MoS2 nanosheets have been recognized as a good candidate for use as electrodes in supercapacitors because of their high intrinsic fast ion conductivity and high surface area. Soon and Lohz have reported that the capacitance obtained when MoS2 is used as the electrode is comparable to that obtained when carbon nanotube arrays are used. Herein, synthesis using bottom-up chemical synthetic methods and characterization of molybdenum dichalcogenide nanomaterials is reported. Their properties and relevance to application in supercapacitors is discussed.

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Ms Siziwe Gqoba, Siziwe.Gqoba@wits.ac.za,University of the Witwatersrand

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Primary author: Mr NDALA, Zakhele (University of the Witwatersrand)

Co-author: Ms GQOBA, Siziwe (University of the Witwatersrand)

Presenter: Mr NDALA, Zakhele (University of the Witwatersrand)

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