

Vienna, 26/01/2021

## Master thesis on the characterisation of 3D-printed high-performance materials for applications in precision experiments

The Stefan Meyer Institute for Subatomic Physics ([www.oeaw.ac.at/smi/home/](http://www.oeaw.ac.at/smi/home/)) is currently looking for a Master student for a project in general support of our experiments on the precision frontier of particle physics. The goal is to characterize the performance of 3D-printed polymer and ceramic parts under ultra-high vacuum and cryogenic conditions to assess their potential applications in precision physics experiments.

Test pieces will be produced using 3D printers of two world leading companies in the field of additive manufacturing, namely Cubicure<sup>1</sup> (polymers, device available at SMI) and Lithoz<sup>2</sup> (ceramics, parts produced by Lithoz). The properties which should be characterized at various temperatures are outgassing rates using residual gas analysis, thermal conduction, thermal expansion, and electric isolation properties. With the support of SMI's advanced instrumentation group the successful candidate shall design and construct a vacuum test stand with the necessary cryogenic and measurement equipment, develop the measurement strategy and appropriate geometries of test pieces, perform measurements, and analyse the results. Contact persons of Cubicure and Lithoz will assist with their expertise on additive manufacturing when necessary.

The following skills will be an asset: experience in experimental physics and working in laboratories, basic knowledge of vacuum and cryogenic equipment as well as data acquisition and analysis, interest for or experience in additive manufacturing, creativity for designing experiments and solving problems.

As this project requires presence in the laboratories and training on machines the start should be handled flexible and on personal agreements due to Covid rules.

To apply please email your CV, relevant certificates and university grades as well as a short motivation letter to:

Prof. Dr. Eberhard Widmann ([eberhard.widmann@oeaw.ac.at](mailto:eberhard.widmann@oeaw.ac.at)) and  
Dr. Martin Simon ([martin.simon@oeaw.ac.at](mailto:martin.simon@oeaw.ac.at))

Applications will be considered until the position is filled.

References:

[1] [www.cubicure.com](http://www.cubicure.com)

[2] [www.lithoz.com](http://www.lithoz.com)