



Invitation to the Seminar Talk of Prof. Matthias Muehle

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Technological advancements in diamond technology

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TU Dresden, Hermann Krone Building, Nöthnitzer Str. 61

01187 Dresden | Room KRO 1.11

Abstract

In this seminar Dr. Muehle will speak about the specific research projects and technological advancements in diamond technology that his team at CMW is working on. This includes addressing the need that device fabrication can be done on economically viable wafer sizes (> 50 mm). Research projects towards this are: (a) size enlargement of single-crystalline diamond wafers by means of homoepitaxy up to 25 mm, with trajectory to 100 mm, as well as (b) heterointegration of diamond with other wide bandgap semiconductor materials by creation of diamond nanomembranes that can be used as active device layers or thermal elements. Additionally, his team also works on advances to diamond devices itself via (i) advancements in the epilayer growth process for p-type and n-type doped diamond, and (ii) development of a chemical-mechanical polishing process that can achieve near-atomic roughness while removing as little as 100 nm of diamond during the smoothing process.

Bio

Matthias Muehle received the Diploma degree in physics from Technische Universität Dresden, Germany, and the Ph.D. degree in electrical engineering from Michigan State University, USA, in 2017. He is currently the Manager Diamond Technologies at Fraunhofer USA, Center Midwest (CMW). He has 14 years of experience working in diamond synthesis, wafer fabrication and device applications. His personal research focus is in diamond growth for (ultra) wide bandgap semiconductor integration.