【特別セミナー Special Seminar】 The seminar is in English.

Heterogeneous Integration and Packaging Technologies for 3D MEMS and NEMS
3 次元 MEMS･NEMS のためのヘテロ集積化･パッケージング技術

日　時：2018 年 4 月 27 日（金曜日）　16:20～17:50
27 April 2018 (Friday)　16:20～17:50
参加無料，事前申込不要　Admission free, No advanced registration required

場　所：東北大学　青葉山キャンパス　マイクロ・ナノマシニング研究教育センター　3 階　セミナー室
Tohoku University, Aobayama Campus, Micro-Nanomachining Research & Education Center (MNC), 3rd floor, Seminar room
（田中(秀)研究室ウェブサイト「アクセス」ページの地図上 A14 の建物）
（Building A14 on the map at http://www.mems.mech.tohoku.ac.jp/access/index_e.html）

主　催：田中(秀)研究室，マイクロ・ナノマシニング研究教育センター
Organized by S. Tanaka Laboratory and MNC, Tohoku University

講　師：
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Dr. Frank Niklaus received his M.Sc. degree in mechanical engineering in 1998 from the Technical University of Munich (TUM), Germany. In 2002 he received his PhD degree in microelectromechanical systems (MEMS) from KTH Royal Institute of Technology in Stockholm, Sweden. Since 2013 he is a Professor with the Department of Micro and Nanosystems at KTH, where he is heading the Micro and Nanofabrication Group. The current research interests of Dr. Niklaus include innovative manufacturing, integration, and packaging technologies for MEMS and nanoelectromechanical systems (NEMS) and graphene-based NEMS devices. He has published more than 160 journal and conference papers and has more than 10 granted patents. Dr. Niklaus is a member of the Young Academy of Europe (YAE) and IEEE Senior Member.

概　要：
Micro- and nanoelectromechanical system (MEMS and NEMS) components are vital for many industrial and consumer products such as airbag systems in cars, which have a large impact on society. However, the potential of MEMS and NEMS is still being hampered by their dependence on integrated circuit (IC) manufacturing technologies that are characterized by highly standardized manufacturing processes for realizing 2-dimesnional structures. In contrast, most MEMS structures are 3-dimesnional in nature and the required manufacturing volumes are often counted in a few 100 wafers per month. In this talk I will present a number of innovative integration and packaging technologies for 3D MEMS and NEMS that extend on the standard semiconductor fabrication technologies and that have recently been developed at KTH. These technologies include wafer-level heterogeneous 3D integration of NEMS and ICs used for IR bolometer arrays, micro-mirror arrays and NEM relays for low-power logic circuits. Furthermore, I will present the use of high-speed wire bonding for realizing devices such as through-substrate vias (TSVs) and IR emitters, and the integration of atomically thin graphene membranes in NEMS for ultraminiaturized pressure sensors.