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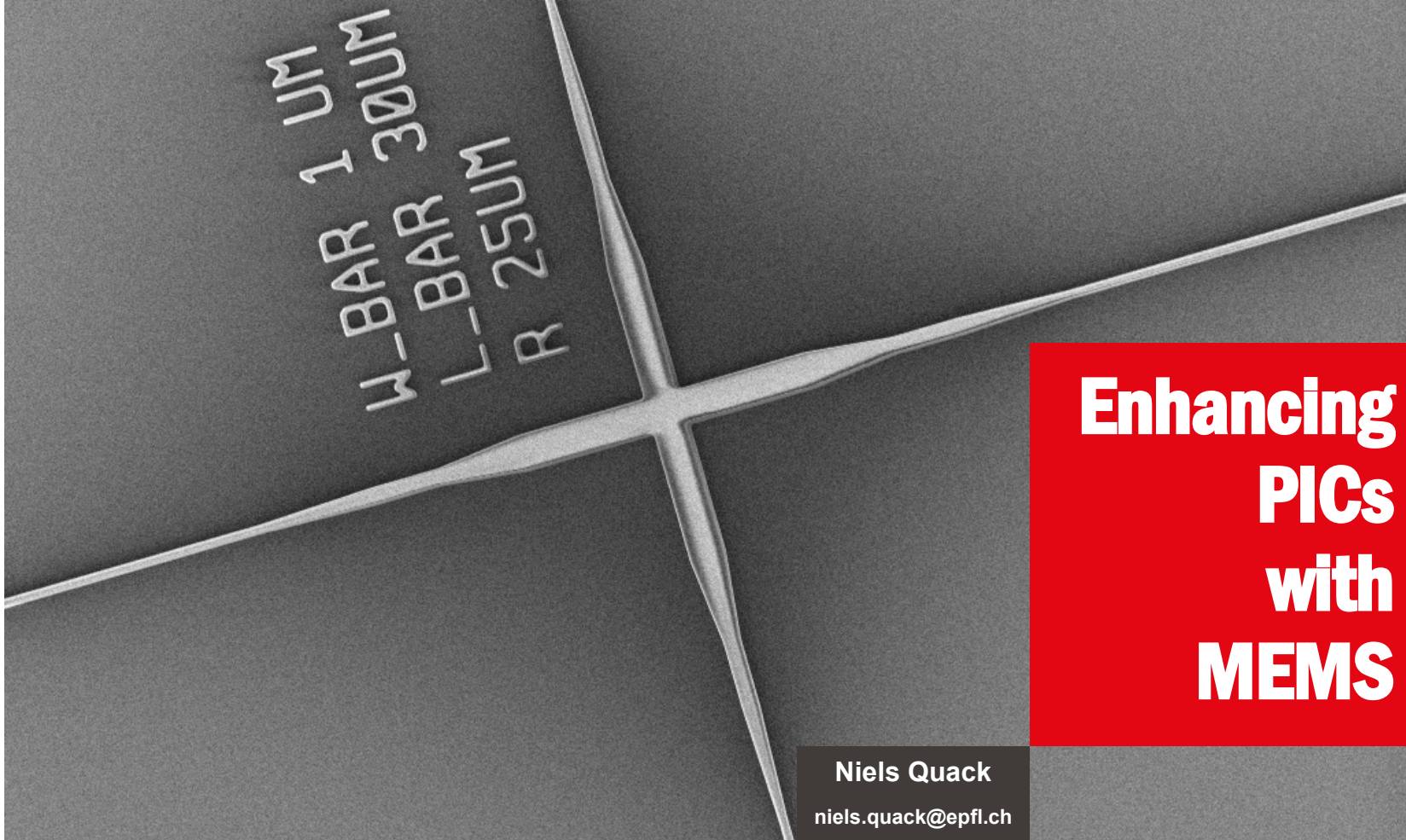
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Enhancing PICs with MEMS

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Enhancing PICs with MEMS

- The following slide contains selected references of presented work.
- For participants of the workshop, a copy of the slide deck can be inquired by email to niels.quack@epfl.ch

EPFL Acknowledgements & Selected Publications

Photonic MEMS:

- [Carlos Errando-Herranz, Alain Yuji Takabayashi, Pierre Edinger, Hamed Sattari, Kristinn B. Gylfason, Niels Quack, "MEMS for Photonic Integrated Circuits", IEEE JSTQE, 2019.](#)
- [Niels Quack, Hamed Sattari, Alain Yuji Takabayashi, Yu Zhang, Peter Verheyen, Wim Bogaerts, Pierre Edinger, Carlos Errando-Herranz, and Kristinn B. Gylfason, "MEMS-enabled Silicon Photonic Integrated Devices and Circuits", IEEE JQE, 2019.](#)

Silicon Photonic MEMS Switch Matrices:

- [Tae Joon Seok, Niels Quack, Sangyoon Han, Richard S. Muller and Ming C. Wu, Highly scalable digital silicon photonic MEMS switches, Journal of Lightwave Technology, Vol. 34, Issue 2, p. 365-371, 2016](#)
- [Tae Joon Seok, Niels Quack, Sangyoon Han, Richard S. Muller and Ming C. Wu, "Large-scale broadband digital silicon photonic switches with vertical adiabatic couplers", Optica, vol 3, num. 1, p. 64-70, 2016.](#)

Packaging of Photonic MEMS:

- [Hwang, H.Y., Lee, J.S., Seok, T.J., Forench, A., Grant, H.R., Knutson, D., Quack, N., Han, S., Muller, R.S., Papen, G.C., Wu, M.C., O'Brien, P., "Flip Chip Packaging of Digital Silicon Photonics MEMS Switch for Cloud Computing and Data Centre," IEEE Photonics Journal, 2017.](#)
- [Gaehun Jo, Pierre Edinger, Simon Bleiker, Xiaojing Wang, Alain Yuji Takabayashi, Hamed Sattari, Niels Quack, Moises Jezzini, Peter Verheyen, Göran Stemme, Wim Bogaerts, Kristinn B. Gylfason, and Frank Niklaus, "Optical and Electrical Feedthroughs for Wafer-Level Vacuum Sealed Silicon Photonic MEMS Packages", SPIE OPTO, Silicon Photonics XVI, 2021.](#)

MORPHIC Technology & Switches

- [Alain Yuji Takabayashi, Hamed Sattari, Pierre Edinger, Peter Verheyen, Kristinn B Gylfason, Wim Bogaerts, Niels Quack, "Broadband Compact Single-Pole Double-Throw Silicon Photonic MEMS Switch", JMEMS, 2021.](#)
- [Wim Bogaerts, Hamed Sattari, Pierre Edinger, Alain Yuji Takabayashi, Iman Zand, Xiojing Wang, Antonio Ribeiro, Moises Jezzini, Carlos Errando-Herranz, Giuseppe Talli, Kumar Saurav, Marco Garcia Porcel, Peter Verheyen, Banafsheh Abasahl, Frank Niklaus, Niels Quack, Kristinn B. Gylfason, Peter O'Brien, and Umar Khan: "MORPHIC: Programmable photonic circuits enabled by silicon photonic MEMS", Proceedings of SPIE OPTO, January 2020.](#)

Nonvolatile Photonic MEMS Switch Concept

- [Hamed Sattari, Adrien Toros, Teodoro Graziosi, Niels Quack, "Bistable Silicon Photonic MEMS Switches", SPIE OPTO, MOEMS and Miniaturized Systems XVIII, 10931-13, 2019.](#)



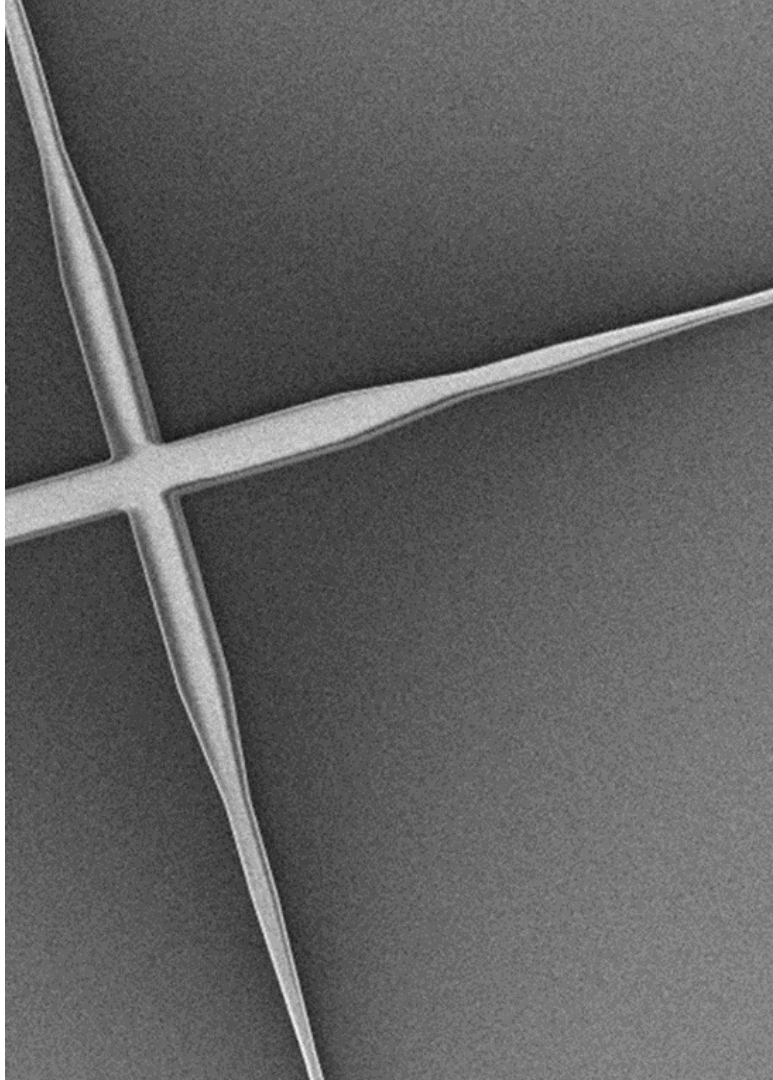
Dr. Hamed Sattari, Jonas Jacobs, Dr. Marcell Kiss, Dr. Teodoro Graziosi, Yuji Takabayashi, Yu Zhang, Dr. Anton Lgosh, Dr. Hernán Furci, Dr. Micol Previde Massara



Prof. Ming C. Wu, Prof. Richard Muller, Prof. Tae Joon Seok, Prof. Sangyoon Han



Wim Bogaerts, Iman Zand, Xiaojing Wang, Antonio Ribeiro, Moises Jezzini, Giuseppe Talli, Saurav Kumar, Marco Garcia Porcel, Peter Verheyen, Peter O'Brien, Umar Khan, Pierre Edinger, Dr. Carlos Errando-Herranz, Prof. Kristinn B. Gylfason, Gaehun Jo, Prof. Frank Niklaus



**Bright Future
for
MEMS in PICs!**

**Thank you for your
attention.**