

A photograph of a laboratory bench with two microfluidic chips. The chips are circular with a central square and four radial channels. They are placed on a green surface with a grid pattern. The background is slightly blurred, showing other lab equipment and a window.

MUT 2018

International Workshop on Micromachined
Ultrasonic Transducers 2018

June 7 - 8 2018, Ajaccio (Corsica - France)

08:45 Registration

09:15 Welcome : Dominique Certon, GREMAN UMR 7347
Tours university, CNRS, INSA Centre-Val de Loire

Applications 1 - Chair : Hayrettin Koymen

09:30 **Invited paper** - N. S n gond, D. Gross, T. Mat o, M. Cheppe, L. Pasquet, P. Vince, C. Meynier & An Nguyen-Dinh
Vermon's CMUT development: toward industrial MEMS transducers

10:00 Reza Pakdaman Zangabad¹, Gijs Van Soest¹, A.F.W. Van Der Steen^{1,2,3}
Coded Excitation Imaging for a CMUT-based Side Looking Intravascular Ultrasound System

¹Biomedical Engineering Department, Erasmus Medical Center, Rotterdam, Netherlands ; ²Department of Imaging Science and Technology, Delft University of Technology, Delft, Netherlands ; ³Shenzhen Institute of Advanced Technology, Shenzhen, China

10:20 W.A. N'Djin^a, C. Bawiec^a, G. Bouchoux^a, N. S n gond^b, N. Guillen^c, J.Y. Chapelon^a
Planar CMUT annular-array with integrated imaging for ultrasound-guided High Intensity Focused Ultrasound

^aLabTAU, INSERM, Centre L on B rard, Universit  Lyon 1, Univ Lyon, F-69003, Lyon, France ; ^bVermon, Tours, 37038, France ; ^cEDAP TMS, Vaulx-en-Velin, 69120, France

10:40 **Break**

Processing, fabrication, materials - Chair : Erik Vilain Thomsen

11:10 J. Lascaud^a, T. Defforge^a, L. Colin^a, M. Perroteau^b, C. Meynier^b, D. Alquier^a, G. Gautier^a and D. Certon^a
Benefits of porous silicon layer on the Lamb wave propagation in the substrate of CMUT-based linear arrays

^aUniversit  de Tours, GREMAN UMR7347, CNRS, INSA-CVL, 16 Rue Pierre et Marie Curie, 37071 Tours, Cedex 2, France ; ^bVERMON, S.A, 180 Rue du General Renault 37038 Tours, France

11:30 I.Lucarini¹, A.Minotti¹, F. Maita¹, A. Pecora¹, A. S. Savoia³, Aditi², R. Mukhiya² and L. Maiolo¹
Design, fabrication and characterization of SU-8 Polymer-based CMUT for developing potentially flexible ultrasonic devices

¹IMM-CNR, Via del Fosso del Cavaliere 100, 00133 - Rome (Italy) ; ²CSIR-CEERI, Central Electronics Engineering Research Institute, Pilani-333031 - Rajasthan (India) ; ³Universita degli Studi Roma Tre, Department of Engineering, Via della Vasca Navale 84, 00146-Rome (Italy)

- 11:50 Martin Lind Ommen, Erik Vilain Thomsen
Reduced cavity pressure in CMUTs: Is a wafer bonder necessary?
Department of Micro and Nanotechnology, Technical University of Denmark, Kgs. Lyngby, Denmark
- 12:10 Zeyu Chen², Xian Song², Yang Yang², Yong Chen² and Qifa Zhou^{1,2*}
Novel 3D printing technology for piezoelectric ultrasound transducer application
¹Roski Eye Institute, ²School of Engineering, University of Southern California, Los Angeles, CA 90089, USA
- 12:30 **Lunch**
- Fundamentals 1 - Chair : Abdullah Atalar**
- 14:00 Evren F. Arkan¹, F. Levent Degertekin¹
Analysis and Design of High Frequency CMUT Imaging Arrays in Non-Collapsed Mode
George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, Georgia, USA
- 14:20 Mathias Engholm¹, Andrew Tweedie², Kevin Chan², and Erik Vilain Thomsen¹
Simulating and Optimizing CMUTs Using OnScale and Cloud Computing
¹Department of Micro and Nanotechnology, Technical University of Denmark, Kgs. Lyngby, Denmark ; ²OnScale, Glasgow, United Kingdom
- 14:40 G. Massimo¹, A. Colombo¹, R. Ardito¹, F. Quaglia², A. Corigliano¹
Multiphysics modelling and experiments of an air-coupled array of PMUTs
¹Department of Civil and Environmental Engineering, Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133 Milan, Italy ; ² Analog, MEMS & Sensors Group, ST Microelectronics, Via Tolomeo 1, 20010 Cornaredo, Italy.
- 15:00 **Break**
- Applications 2 - Chair : Levent Degertekin**
- 15:30 C. Bulbul, H. Koymen, A. Atalar
Designing an array of transimpedance amplifiers for a CMUT array
Electrical and Electronics Engineering Department, Bilkent University, Ankara, TURKEY
- 15:50 Jérôme Parent, Yves Emery
Sponsor presentation : Lyncée Tec SA, Lausanne, Switzerland
DHM, and ideal tool for static and dynamical MUT measurements, and more
- 16:10 Kevin Chan
Sponsor presentation : OnScale, United Kingdom
Breaking Computer Barriers to Engineering Simulation

Friday 8th June, 2018

Applications 3 - Chair : Nicola Lamberti

- 09:30 **Invited paper** - Fabio Quaglia
Micro-machined actuators and ultrasonic transducers - an industrial perspective
STMicroelectronics, Milan, Italy
- 10:00 Roger J. Zemp¹, Chris Ceroici¹, Kate Latham², Ben Greenlay¹, and Jeremy Brown²
TOBE or not TOBE: Top Orthogonal to Bottom Electrode 2D Ultrasound CMUT and Electrostrictive Transducer Technologies for 3D Ultrasound and Photoacoustic Imaging
¹Dept. of Electrical and Computer Engineering, University of Alberta, ; ²Depts. of Bio-medical Engineering and Electrical Engineering, Dalhousie University
- 10:20 Alessandro Stuart Savoia¹, Tung Manh², Barbara Mauti¹, Giosuè Caliano¹, Tonni Franke Johansen³, Frédéric Lanteri⁴, Lars Hoff², Trym Eggen⁵, Jean-François Gelly⁴
Design, Fabrication and Characterization of a Hybrid Piezoelectric-CMUT Dual-Frequency Ultrasonic Transducer
¹Department of Engineering, Roma Tre University, Rome, Italy ; ²Department of Micro-systems, University of South-Eastern Norway, Borre, Norway ; ³Department of Acoustics, SINTEF ICT, Norway ; ⁴GE Parallel Design SAS, Sophia Antipolis, France ; ⁵GE Vingmed Ultrasound AS, Horten, Norway
- 10:40 **Break**

Fundamentals 2 - Chair : Giosue Caliano

- 11:10 A. Atalar, M. Khan, T.M. Khan[†], A.S. Taşdelen[‡], M. Yilmaz[†], H. Koymen
Increasing the receive sensitivity of a collapsed-mode airborne CMUT in snap-back region
Electrical and Electronics Engineering Department, [†] UNAM, [‡] BASTA, Bilkent University, Ankara, TURKEY
- 11:30 Sushruta Surappa¹, Molei Tao², F. Levent Degertekin¹
1D Lumped Parameter Modeling of CPUT: A Capacitive Transducer without DC bias or Pre-Charge
¹G.W. Woodruff School of Mechanical Engineering, ²School of Mathematics, Georgia Institute of Technology, Atlanta, GA USA
- 11:50 Andreas Spandet Havreland¹, Mathias Engholm¹, and Erik Vilain Thomsen¹
CMUT Electrode Design: Modelling and Experimental Verification
¹Department of Micro and Nanotechnology, Technical University of Denmark, Kgs. Lyngby, Denmark
- 12:30 **Lunch**