

IEEE International 3D Systems Integration Conference (3DIC) 2023

The IEEE International 3D Systems Integration Conference (3DIC) 2023 was held at Tyndall National Institute, University College Cork, Ireland from May 10th -12th, 2023. This conference combines the previous IEEE EDS Society sponsored International 3D System Integration Conference, held in Tokyo in 2007 & 2008, and the Fraunhofer and IEEE CPMT sponsored International 3D System Integration Workshop held in 2003 & 2007 in Munich. After the first combined conference in San Francisco 2009, the 3DIC took place in Munich in 2010 followed by Tokyo in 2011. The intention was to rotate over the three continents: America, Europe and Asia. 2023 was again Europe's turn and we were very happy that Tyndall National Institute hosted this year's conference in the beautiful city of Cork, Ireland.



Group picture of 3DIC 2023 speakers and organizing committee at University College of Cork (UCC)

The General Chair, Prof. Cian O'Mathuna, opened the conference introducing the keynote speaker Prof. Rao Tummala as the pioneer of advanced system integration technology and "The George Best of Packaging". He delivered the plenary talk of the conference on 10th May, on "Emergence of Glass Panel Packaging and 3D Glass Panel Embedded Package for Superior Bandwidth". He also delivered another well received invited talk on "Emergence of Indian Electronics".



Prof. Rao Tummala presenting the Opening Keynote of 3DIC 2023

The second highly received keynote talk was given by Dr. Paul Fischer, Senior Principal Engineer, Intel Corp., delivering on "Recent Advances in 3D Heterogeneous Integration Capabilities and Future

Possibilities”. The Day-3 keynote speaker was Mark Gerber from ASE, Global group on “Performance Enablement through VIPack FOPOP for Mobile and Networking”.

Other invited speakers from various organizations and industries delivered talks on current and future trends in 3DIC (see table).

Title of the talk	Speaker name	Affiliation
Micro Transfer Printing - An Advanced Assembly Technology for Heterogeneous Integration	Dr. Alin Fecioru	X-Celeprint
Wide Bandgap Semiconductor Packaging: Challenges and Innovations in Power Electronics	Dr. Jayakrishnan Chandrappan	CSA Catapult, UK
IC and Photonic Device Fabrication and Packaging Services	Dr. Romano Hoofman	IMEC
Photonic Systems-in-Packages Based on Think Glass - pSiP	Dr. Gunnar Böttger	Fraunhofer IZM
Advanced Packaging Goes to Market	Dr. Robert Patti	Nhanced Semiconductors, Inc
Integrated Photonics-Electronics from Research to Manufacturing	Prof. Peter O'Brien	Tyndall
Advanced Interconnects for Chiplets	Jonathan Abdilla	Besi
Development of a Microcamera Research for Biophotonics Applications	Prof. Stefan Andersson-Engels	Tyndall
3D Integration for Quantum Computing	Prof. Ryoichi Ishihara	TU Delft

The attendees of the conference in Cork included researchers from industry, academia and research institutions. There was participation from industries like Analog Device Inc., Intel, ISD Aerospace, IBM, Besi, ZEISS, A-Gas EM, ASE Global group, Cadence Design Systems, X-Celeprint, Siemens, CSA Catapult, Nhanced Semiconductor Inc. and Ficon Tech. Research organisations like Sandia National Laboratories, Research Association for Advanced Systems, Silicon Austria Labs, Tyndall National Institute, VTT Technical Research Center of Finland Ltd., IMEC, Fraunhofer and Semiconductor Sector Service Bureau also had delegates participating at the conference. In the academic sector the conference saw participation from North Carolina State University, Teikyo Heisei University, TU Delft, Tohoku University and National Taiwan University.

The Gala Dinner of the conference was organized at River Lee Hotel, Cork and had the Irish cultural programme with music and dance. The conference had a Best Student Paper award constituted and sponsored by PIXAPP Pilot Line. Ms. Parnika Gupta won the award for her paper titled “*Thermal Management Strategies for Co-packaged Optics on Glass Interposers in Next-Generation Photonic Packaging*”. Prof. Rao Tummala presented the award to her.



Prof. Rao Tummala presenting the Best Student Paper Award to Ms. Parnika Gupta (Tyndall)



Best Student Paper Award winner Parnika Gupta (Tyndall) taken in the middle of organizing committee members: Grace O'Malley (inemi), Brian Corbett (Tyndall), Paul Franzon (NCSU), Cian O'Murchu (Tyndall), and Veda Sandeep Nagaraja (Conference Organizer, Tyndall)

We were proud that Prof. Koyanagi, Tohoku University attended the conference in Ireland. He is the pioneer of 3DIC technology. Towards the end of the 1990's Mitsumasa Koyanagi's team in Sendai, for the first time in the world, succeeded in fabricating 3DICs using TSV, explicitly 3D stacked image sensor and 3D stacked memory test chips representing the pioneering contributions of today's two key applications in high volume production. In 2020, he was awarded with the IEEE Electronics Packaging Technology Award 2020, together with Peter Ramm, Fraunhofer EMFT Munich – and their nominator was Prof. Rao Tummala. A snapshot of these 3DIC 2023 “senior attendees” was taken in the conference lobby at University College Cork.



Mitsumasa Koyanagi (Tohoku Univ.), Rao Tummala (ex-Dir. GT) and Peter Ramm (Fraunhofer EMFT)

Dr. Peter Ramm
Sr. Member IEEE, IMAPS Fellow and Life Member