

PRESS RELEASE

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FMD and Intel join forces to accelerate research progress on 3D Heterogeneous Integration for 2030+ in Germany and Europe

Since July 2022 the Research Fab Microelectronics Germany (FMD) and Intel have been collaborating to champion and drive 3D heterogeneous integration R&D in Germany. In a series of technical workshops organized by FMD and Intel Europe Research, experts from FMD, Intel, and German industries have defined their 2030+ research roadmap for 3D heterogeneous integration. Challenges and opportunities have been identified for major application areas such as automotive, industry and high-performance computing establishing the foundation for joint research projects in these critically important areas. This is part of the effort in building a strategic research partnership between FMD and Intel to grow heterogeneous 3D integration capabilities in Germany and in Europe, which is also a key topic of Intel Europe Research engagement in the European R&D ecosystem.

Recently the semiconductor industry has shifted to 2.5D and 3D packaging for more compute and memory per area and/or volume, while the chiplet ecosystem is evolving and heterogeneous integration is advancing to enable increased functionality in package with high performance and minimized overhead in area, cost, and complexity. It is expected in the next decade 3D heterogeneous integration will enable co-integration of many important functions such as compute, storage, connectivity, AI, and sensing all in the same chip with near-monolithic performance and high reliability in a cost-effective manner. For this to become a reality it is important to define a 2030+ 3D heterogeneous integration roadmap for the various industries (e.g. automotive, data center, industry automation, communication, aerospace and defense) and drive research programs to overcome challenges and bring innovations to enable the field.

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To champion 3D heterogeneous integration R&D in Germany and Europe, FMD is teaming up with Intel to identify the challenges and opportunities of, create a 2030+ R&D roadmap for, and initiate and drive research programs to enable and maximize the potential of 3D heterogeneous integration for various industries covering a wide spectrum of applications. We have invited German and European industry partners along the entire value chain starting with materials, process equipment through chip design, assembly, printed circuit boards to complete integrators to participate in addressing gaps, challenges, and opportunities. In the last 12 months FMD and Intel Europe Research have organized a series of technical workshops, with participation from many German companies, to define the essential aspects and components of the 2030+ roadmap that need to be addressed and worked on.

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Involvement of German and European stakeholders to strengthen position in the 3D heterogeneous integration field

In October last year FMD and Intel held the first technical workshop in Berlin with participation from both Fraunhofer and Intel technical experts to establish a solid basis for the 2030+ 3D heterogeneous integration research roadmap and to identify challenges and opportunities. It was concluded that to cover the entire spectrum of applications and to effectively address all the challenges across the supply chain, participation from various German and European industries would be needed. Therefore, in subsequent FMD-Intel technical workshops in March and April 2023, many German companies joined and contributed their perspectives and expertise to numerous important topics including architecture, chip design, manufacturing processes, system and technology co-optimization (STCO), materials, metrology, modeling and simulation, substrates, automation, reliability, etc., which are important for forming the foundation of 3D heterogeneous integration for 2030+ for different applications.

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“These workshops definitely enable the extraordinary partnership between FMD, Intel and German industries that will enormously advance German and European research and development in 3D heterogeneous integration“, explains Prof. Albert Heuberger, Chairman of the FMD Steering Committee and spokesman of the Fraunhofer Group for Microelectronics. In January this year he met with Pat Gelsinger, CEO of Intel, in California, U.S. to discuss expansion of the Fraunhofer-Intel R&D partnership.

“3D heterogeneous integration for 2030+ is a very important research topic for Moore’s Law extension and beyond, and we are very glad to partner with Fraunhofer to champion and drive the research in Germany and in Europe“, highlighted Robert Chau, Director Intel Europe Research and Intel Senior Fellow in Technology Development. Recently Intel has brought its prowess and expertise in semiconductor and packaging research and technology to work with European partners to develop Moore’s Law innovations and advance microelectronics in Europe. In 2022, Chau relocated from the U.S. to Europe to lead Intel Europe Research and to drive Intel’s R&D with partners on the continent.

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A historic meeting which marks the beginning of an extraordinary partnership: 1st FMD-Intel workshop on 3D heterogeneous integration for 2030+ in Berlin on October 28, 2022. © Fraunhofer MIKROELEKTRONIK

About the Research Fab Microelectronics Germany

The Research Fab Microelectronics Germany (FMD) as a cooperation between the Fraunhofer Group for Microelectronics and the Leibniz institutes FBH and IHP is the central contact for all questions relating to microelectronics and nanoelectronics in Germany and Europe. As a one-stop shop, FMD has been combining scientifically excellent technologies and system solutions from its 13 cooperating institutes from the Fraunhofer-Gesellschaft and Leibniz Association into a customer-specific overall offer since 2017. Under the virtual umbrella of the FMD, the largest merger of its kind in Europe was created with more than 4,500 employees and a unique variety of skills and infrastructure. From 2017 to 2021, the Federal Ministry of Education and Research supported the modernization of the research infrastructure of all 13 participating institutes.

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