

# CITC 2024 Results



Chip Integration  
Technology Center



## TEAM

31 people worked for CITC



35%

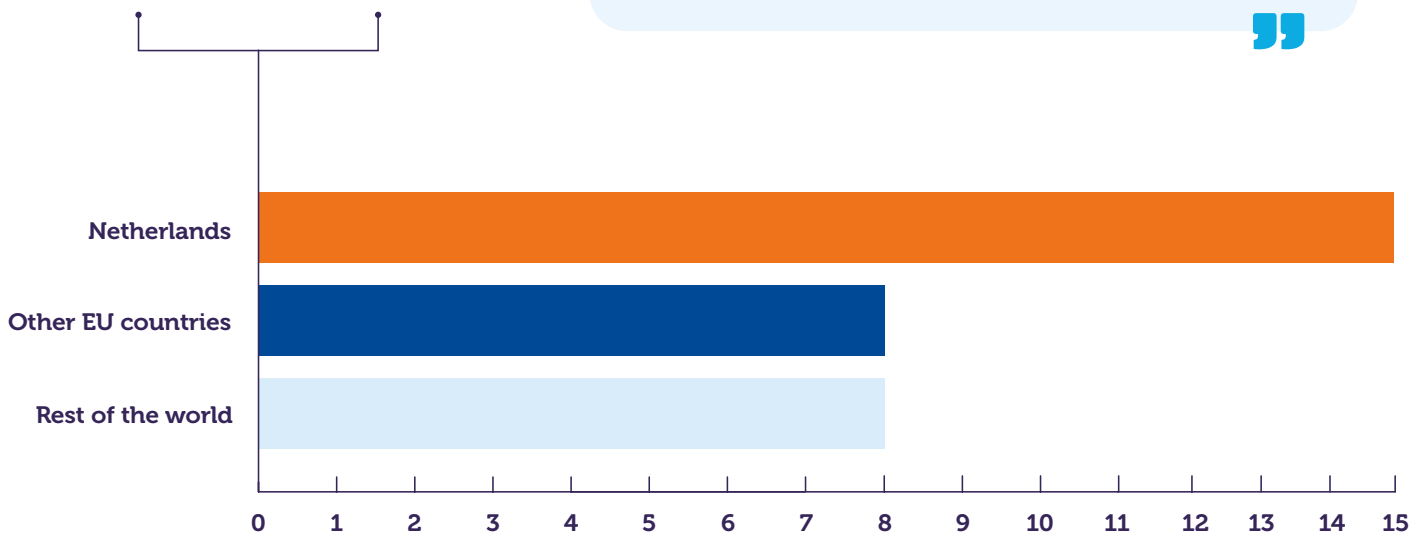


65%



In 2024, Toni Versluijs was appointed incoming chairman of the CITC Supervisory Board. He succeeds chairman Roel Forville, who retired on January 1, 2025.

*"CITC has a unique position between private parties, academia and knowledge institutes. I am convinced that it has the potential to change the world of semiconductor packaging".*



## CORE ACTIVITIES

Our core activities are providing access to

**Innovation**



**Infrastructure**



**Education**



## ACCESS TO INNOVATION



Spoken at conferences:

**11**



Published scientific articles:

**9**



New strategic partnerships:

**6**



Submitted patents:

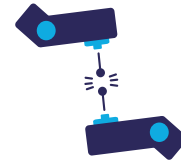
**9**



New participations in European projects: **1**



Generated measurement data: **348 GB**

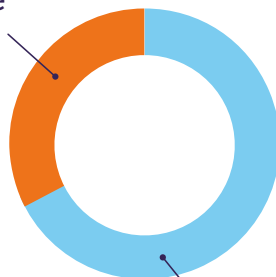


Integrated photonics systems built: **65**

**33,894** wirebonds made with **74,567 mm** wire



**23,520** aluminum wire

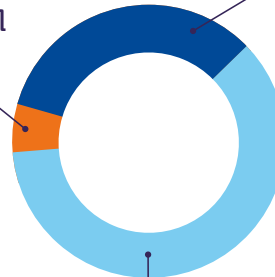


**51,047** gold wire

**2,365** placed dies



**65** optical dies  
**420** RF dies



**1,880** high-power dies



## ACCESS TO INFRASTRUCTURE



**521,000 euro**  
invested in  
our lab



New  
equipment:  
**3**



**36**  
Company visits  
to our labs



**4**  
Permanent guest  
researchers



Philinde van Selm, project leader at ANDERS foundation Nijmegen:

**"When CITC moved to its new office, there were still a few beautiful ergonomic desks left. Because they were still in very good condition, we were asked to find a new home for them. They were gone in no time. Now, a teenage boy does his homework at a nice desk, the ladies of the Wereldvrouwenhuis have a good place to study and the volunteers of De Kentering work ergonomically. As we say: "giving makes you rich!"**



## ACCESS TO EDUCATION



**28 students**  
trained in Semiconductor  
Packaging University Program



**597 hours**  
of training  
provided



**Supervision of:**  
8 bachelor interns and  
graduation students and  
4 PhD students



**Students attending guest  
lectures, excursions and events:**  
285 primary school,  
570 secondary school,  
21 bachelor and 69 master



Joop Bruines, coordinator of the Semiconductor Packaging University Program, was happy with yet again a full classroom:

**"We had a nice mix of people. In addition to industry participants, there were fifteen bachelor students from HAN and similar Dutch universities of applied sciences, and from Hochschule Rhein-Waal. There was one PhD student from University of Twente and, just like last year, we have a group of four professors from Universidad Tecnológica de Panamá who followed the program online"**

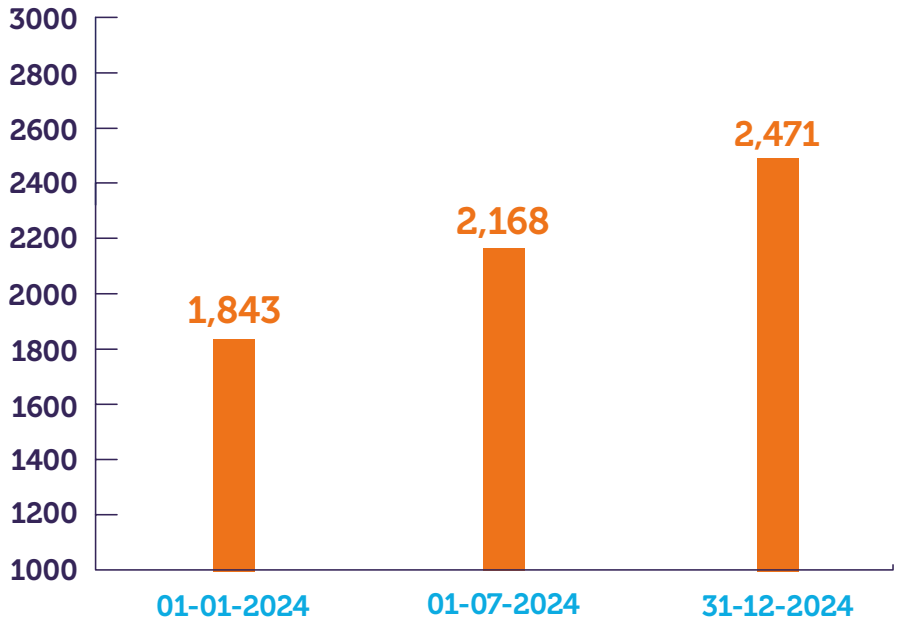


# MARKETING



Number of followers on LinkedIn

Increase of 34%



14,494 visitors to our website

Increase of 4,5%



CITC's PhD candidate Henry Antony Martin received the Best Poster Award at the 25th EuroSimE conference.

"I am grateful for the recognition and would like to thank all co-authors from CITC and the Electronic Components, Technology and Materials group at Delft University of Technology."



Participated in

**38 events**

Exhibitions and conferences:  
21

Self-organized:  
10

Other events:  
7



## 2024: A YEAR OF FIRSTS

**CITC's first lustrum year was a year full of firsts and special moments. Most importantly, we were able to realize growth in our office and lab space. Without having to leave the Noviotech Campus, CITC secured a location with room for growth in the coming years. This was a crucial step in achieving our ambition to become a world-class research lab.**

Another special moment was our first CITC Innovation Day in September. Together with our founding partners, we updated almost 90 participants on the latest developments in chip and photonics packaging. Apart from the high-quality presentations and pitches, this day showed how important collaboration is within innovation.

### Innovation

Innovation is at the heart of CITC's existence. In our four program lines we work on developments that contribute to solving societal challenges. Future challenges in energy, communications, healthcare, mobility, agriculture and food mean that more and more intelligence needs to be built into products and services. As a key enabling technology, chips and their packaging make this intelligence possible. Another major challenge is to reduce Europe's current dependency on raw materials, technology and manpower.

#### *Program line: Thermal high-performance packaging*

High-power semiconductors are a key ingredient in our energy transition. They will help to maintain and improve our modern and comfortable living standards. Their role in the fight against the climate crisis is crucial; they will help countries achieve their carbon neutrality and zero carbon targets. In 2024, CITC developed its first lead-free clip-attached high-power device.

#### *Program line: RF and mmWave chip packaging*

These chips enable the next generation of high-frequency applications. Future communication networks must be even faster, more reliable and more secure than current networks, and preferably made in Europe. Within the research and development of the next generation of communication networks, in particular 6G, CITC developed its first fan-out package in 2024.

#### *Program line: Integrated photonics packaging*

Photonic chips offer new and unique solutions where current conventional technologies reach their limits in terms of speed, capacity and accuracy. Integrated photonics packaging enables low-cost and high-volume photonic packages that can be used in applications such as data and telecom, AI, agrifood, healthcare and mobility. In 2024, CITC developed its first ultra-low loss optical interconnect.

#### *Program line: Advanced additive manufacturing packaging*

Our most promising and disruptive technology development enables an advanced ultra-low-cost and sustainable packaging platform: competitive sustainable advanced packaging (CSAP). This technology is 40% cheaper than products made in China and offers a much less polluting way of production: less toxic materials and less toxic waste. CITC developed the first CSAP demo in 2024, which will be a key ingredient for creating an economically attractive proposition for investments in advanced packaging production in the Netherlands and the EU, while offering an environmentally friendly alternative.

On September 25, mayor Bruls of Nijmegen officially opened the new CITC accommodation. In tribute to our late founder and first general manager, the new lab has been named the Barry Peet lab.



## Infrastructure

Our new location offers enough space for several newly acquired machines. Most notable were the Boschman molding machine and the Finetech Femto 2. The molding machine offers us the possibility to carry out the last step in the production process in-house. This allows the packaging solutions we develop to be fully tested for reliability and consistency. The Finetech advanced automatic sub-micron bonder is a versatile machine with a very well-defined process control. This makes it suitable for both classic and advanced packaging applications.

## Education

CITC works with educational institutions and industry to ensure that talent is given sufficient opportunities to develop the skills that are in demand in the industry regionally and nationally.

Talent is not age-related and that is why we focus on all levels of education: primary and secondary schools, vocational training, bachelor and master programs, EngD and PhD students, and professionals. We help to create enthusiasm for science, technology, engineering, and mathematics by giving children the opportunity to try things out for themselves during events, excursions, and one-day internships.

We offer older students ample opportunities to participate in guest lectures, practical assignments, collaborative projects within the industry, and internships. And finally, we offer formal education to bachelor students, PhD students and industry professionals in our accredited Semiconductor Packaging University Program, set up in collaboration with HAN University of Applied Sciences.

## In conclusion

Since our foundation over 5 years ago, CITC has taken significant steps in realizing its ambition to become a leading partner in semiconductor and photonics packaging. In the coming years, we will continue our research work to reduce the cost of advanced packaging and thus make a major contribution to the return of the packaging industry to the EU. We will continue our efforts to put CITC and Nijmegen on the European chip technology innovation map. By becoming a strong research institute with education and training as part of the offer, we will contribute to making the region more attractive to major investors.



Jibrán Ahmed Khan from Hochschule Rhein-Waal followed the Semiconductor Packaging minor and then did his bachelor thesis at CITC.

**“This email is to inform you that I graduated with a very good grade for my final thesis and colloquium. I am very thankful to CITC for offering such a wonderful opportunity.”**



CITC is a non-profit, joint innovation center specializing in heterogeneous integration and advanced chip packaging technology. We have created an effective ecosystem in which companies, research and educational institutes work on bridging the gap between academics and industry. CITC was founded in 2019 with strategic partners TNO and Delft University of Technology and is supported by local and regional governments. Located on Noviotech Campus Nijmegen, CITC is perfectly situated in the heart of the Dutch semiconductor industry.



# ORGANIZATIONS CITC COLLABORATED WITH IN 2024

## Companies

- Ampleon
- Deepsight
- DTU Fotonik
- Element-6
- Enzyre
- EPFL
- Etteplan
- Filtronic
- Henkel
- Heraeus
- imec
- iPronics
- KDPOF
- Lusospace
- Mini-Circuits
- Nexperia
- NXP
- PHIX
- RJR
- ScioSense
- Tanaka
- Tomoegawa



## Educational institutions

- Ghent University
- Hogeschool van Arnhem en Nijmegen
- IMC Weekendschool
- KU Leuven
- Onderwijs On Stage
- Radboud University
- ROC Nijmegen
- Sterk Techniek
- TU Eindhoven
- University of Twente



## Network organizations

### In the Netherlands

- Briskr
- Chip Tech Gelderland
- Chip Tech NL
- Economic Board
- High Tech NL Semiconductors
- Noviotech Campus
- NXTGEN Hightech
- OostNL
- PhotonDelta

### International

- Aeneas
- EPoSS
- European Center for Power Electronics
- European Photonic Industry Consortium
- KOTRA
- SEMI Europe







## Contact

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