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Changing the World with Microchips – Students Enjoy Success at INVENT a CHIP

- **BMBF and VDE award prizes to winners of INVENT a CHIP 2023**
- **Microelectronics competition for school students attracts 50 percent more participants**
- **Promoting young STEM talent with a focus on sustainability and the energy transition**

(Berlin/Frankfurt am Main, October 24, 2023) The winners have been announced for this year's nationwide INVENT a CHIP competition organized by the German Federal Ministry of Education and Research (BMBF) and the Association for Electrical, Electronic & Information Technologies (VDE). The ten winners, who developed a chip that controls a solar tracker to constantly align a solar power installation with the sun, were selected in Dresden yesterday evening. First place and prize money of €2,000 were awarded to Daniel Graßhoff (17) from the Herder-Gymnasium school in Berlin. The search for talented young people who enjoy Science, Math and Technology is starting to bear fruit, with 50 percent more students participating in the current competition. Overall, around 1,500 young people from a total of 137 schools all over Germany took part.

“Be it AI, autonomous driving or Industry 4.0: There is no digitization and no AI developments without microelectronics. We are dependent on semiconductors. That's why we need to get more young people excited about the key technology of microelectronics. With INVENT a CHIP, we are making an important contribution to this. I am particularly pleased that the number of participants in this student competition has increased significantly and about the creative ideas of all participants. I would also like to thank all the teachers who are committed to supporting the competition at their schools and have made this pleasing development possible,” said State Secretary Prof. Sabine Döring of the BMBF at the awards ceremony in Dresden.

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“Complex chip design, sustainability and the energy transition are the focus of INVENT a CHIP, because microchips enable solutions for many social challenges. These small components are at the heart of all developments from consumer electronics to solutions for climate protection. It's about hardware and understanding how microchips work, as well as the logical principles underlying each particular implementation,” said VDE President Alf Henryk Wulf.

Three winners from the Herder-Gymnasium in Berlin

Winner Daniel Graßhoff (17) from the Herder-Gymnasium in Berlin is delighted with his first place and the prize money of €2,000, but he took part for another reason: “I liked the concept of the competition, that it allows you to learn the most important information about chip design, which would otherwise be difficult on your own.”

The second-place prize of €1,500 went to Leonard Pfeiffer (15), who also attends the Herder-Gymnasium in Berlin. “Programming and rowing are my hobbies. What I like about chip design is the craftsmanship; I like fine-tuning and finding solutions to problems,” said the high-school student. Third place went to Mattis Hänsel (16) from the Gymnasium Groß Ilsede. “In the creative section, I developed a 3D-capable graphics pipeline and used it to show the relative rotation of the solar tracker on a connected display,” the prize winner explained. Fourth place and prize money of €1,000 went to Richard Bonello (17), another student from the Herder-Gymnasium in Berlin.

Students contribute their own ideas

The 25 best high-school students in the INVENT a CHIP Challenge were again invited to a camp in Hanover that lasted several days. “There they were each given their own FPGA board to control their solar tracker. It's fascinating to see how creative young people are and how they implement their ideas technically. We also hope that this will inspire them to study Electrical Engineering. Our current challenges mean that electrical engineers are needed more than ever,” said VDE President Alf Henryk Wulf. The jury's evaluation considered the solar tracker's energy yield, a second measurement that virtually simulates a throttling of the grid feed-in, and creative modifications, such as the elaborate visualization of measured values and the integration of additional sensors. “I implemented the solar alignment so that the chip checks which of the brightness sensors is receiving more light, and the motors then align to that sensor. The throttling works in a similar way, with the system switching to the darker side if a certain value is exceeded,” said first-place winner Daniel Graßhoff.

Since 2002, the INVENT a CHIP competition for young people has provided a platform with exclusive knowledge on the subject of chip design. “This is particularly in demand among German businesses, because technology sovereignty is becoming more important. The

European Chips Act aims to double the European share of microchip production by 2030," said State Secretary Prof. Sabine Döring of the BMBF. This will only work if there are enough well-trained young people. INVENT a CHIP goes beyond classic school learning and challenges the participants to work on their own project. The innovative talent development program is proving successful. Jonathan Gärtner (18) from the Theodor-Heuss-Gymnasium in Ludwigshafen, Germany: "I find it really fascinating to work on problems that can have a real impact on our lives. Also, compared to other disciplines, very little equipment is needed to get started. A computer is all you need." The students also learned the basic functions for designing an integrated circuit at the Institute for Microelectronic Systems at the University of Hanover. They worked on their projects alongside experts there.

The students awarded fifth to tenth place in INVENT a CHIP each receive €500 in prize money. All the winners are given contacts in industry and universities, are nominated for the German National Academic Foundation, and can complete an internship over several days at Bosch in Reutlingen.

The latest round of the INVENT a CHIP competition was supported by numerous sponsors: Bosch, Cologne Chip, Globalfoundries, Infineon, Siemens, DKE German Commission for Electrical, Electronic & Information Technologies in DIN and VDE.

The winners of INVENT a CHIP 2023 at a glance

Daniel Graßhoff (17) from Herder-Gymnasium in Berlin, 1st place (€2,000)

Leonard Pfeiffer (15) from Herder-Gymnasium in Berlin, 2nd place (€1,500)

Mattis Hänsel (16) from Groß Ilsede Gymnasium in Groß Ilsede, 3rd place (€1,000)

Richard Bonello (17) from Herder-Gymnasium in Berlin, 4th place (€1,000)

Linus Musekamp (16) from Willi-Graf-Gymnasium in Saarbrücken, 5th place (€500)

Jonathan Gärtner (18) from Theodor-Heuss-Gymnasium in Ludwigshafen, 6th place (€500)

Hendrik Baras (15) from Schubart-Gymnasium in Ulm, 7th place (€500)

Maximilian Büber (18) from Martineum Gymnasium in Halberstadt, 8th place (€500)

Paul Esterl (18) from Deutschorden-Gymnasium in Bad Mergentheim, 9th place (€500)

Joseph Benz (18) from Ludwig-Georg-Gymnasium in Darmstadt, 10th place (€500)

Further information on the student competition is available at www.invent-a-chip.de

About VDE

VDE, one of the largest technology organizations in Europe, has been regarded as a synonym for innovation and technological progress for more than 130 years. VDE is the only organization in the world that combines science, standardization, testing, certification, and application consulting under one umbrella. The VDE mark has been synonymous with the highest safety standards and consumer protection for more than 100 years.

Our passion is the advancement of technology, the next generation of engineers and technologists, and lifelong learning and career development “on the job”. Within the VDE network more than 2,000 employees at over 60 locations worldwide, more than 100,000 honorary experts, and around 1,500 companies are dedicated to ensuring a future worth living: networked, digital, electrical. Shaping the e-dialistic future.

The VDE (VDE Association for Electrical, Electronic & Information Technologies) is headquartered in Frankfurt am Main. For more information, visit www.vde.com

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