

EVENTS + LOGISTICS – Autonomous Challenge @ CES 2023

- **Tues., Jan. 3 – 6** | 10am – 5pm PT: Practice Trials
 - No shuttle service provided
 - CES Media Credential is required (no exceptions)
 - Location: Las Vegas Motor Speedway

- **Wed., Jan. 4** | 4pm – 4:30pm PST: Media Day – IAC Press Conference
 - *Hear updates from IAC president Paul Mitchell and special guests on new partners for 2023, enhanced technology on this year's racecars, plans for engaging more teams, transitioning into other race formats in 2023-2024, and how teams have advanced to achieve full interaction at high speeds between two autonomous agents without vehicle-to-vehicle communication.*
 - Location: Mandalay Bay, Level 3, Palm A
 - [RSVP here](#)

- **Thurs., Jan. 5** | 10am – 6pm PST: Meet-and-Greets with IAC, teams, sponsors
 - Location: Booth #3601, West Hall, LVCC (Tech East)

- **Fri., Jan. 6** | 9am – 6pm PST: Meet-and-Greets with IAC, teams, sponsors
 - Location: Booth #3601, West Hall, LVCC (Tech East)

- **Fri., Jan. 6** | 4pm – 4:40pm PST: Panel: Driverless at 200 mph
 - *The panel of business and technical leaders will discuss why mastering high-speed automation is so critical to the future of mobility while considering what can be done to push the technology to the 200-mph barrier and beyond.*
 - Panel Members:
 - Paul Mitchell, President, Indy Autonomous Challenge (moderator)
 - Dr. Najwa Aaraj, Chief Researcher, TII
 - Aaron Jefferson, Vice President of Product, Luminar Technologies
 - Location: LVCC, Grand Lobby, CTA Stage

- **Sat., Jan. 7** | 1pm – 3pm PST; Race Day – Autonomous Challenge @ CES 2023
 - 10am PST – Time trials and elimination rounds begin
 - *1pm – 3pm PST – Live broadcast of semi and final competition rounds at www.indyautonomouschallenge.com
 - Roundtrip shuttle transportation will be provided on a first come, first served basis
 - Shuttles will depart from the LVCC West Hall beginning at 11am and ending at 3:45pm PST
 - CES Media Credential is required (no exceptions)
 - [RSVP here](#)

INDY AUTONOMOUS CHALLENGE (IAC)

Background:

- Energy Systems Network (ESN), an Indianapolis-based non-profit and a branded initiative of the Central Indiana Corporate Partnership (CICP) and CICP Foundation, Inc. (CICP Foundation), is the organizer of the Indy Autonomous Challenge (IAC).
- The IAC is inspired and advised by innovators who competed in the Defense Advanced Research Projects Agency (DARPA) Grand Challenge, which put forth a \$1 million award in 2004 that created the modern automated vehicle industry.
- The IAC started as a \$1 million prize competition with 31 university teams signing up to compete more than two years ago, representing top engineering and technology programs from 15 U.S. states and 10 countries.

Goals:

- A primary goal of the IAC is to advance technology that can speed the commercialization of fully autonomous vehicles and deployments of advanced driver-assistance systems (ADAS). These enhancements will lead to increased safety and performance in all modes of motorsports and commercial transportation. In addition, the competition is a platform for students to excel in STEM.
- Beyond improving safety and vehicle performance, the IAC seeks to help overcome three prominent barriers to automated vehicle (AV) commercialization:
 - *Solving “edge case” scenarios* – Problems or situations that occur only at an extreme operating parameter, such as avoiding unanticipated obstacles at high speeds while maintaining vehicular control, need to be addressed to ensure safety across all operating environments
 - *Catalyzing new AV technologies and innovators* – Automated vehicles are too expensive for scaled commercial deployment, and automakers and tech companies are seeking sources of new intellectual property (IP) and qualified engineers and software developers; and
 - *Engaging the public to help ensure acceptance and use of AV technologies* – Increased experience with and exposure to AVs can help facilitate an understanding of them and their potential.

Autonomous Challenge @ CES 2023:

- This competition will be conducted as a single elimination tournament consisting of multiple rounds of head-to-head matches culminating in a championship match. Two cars will participate in each [passing competition match](#). The two cars will take turns playing the role of leader (Defender) and passer/follower (Attacker), and passes will be attempted at ever increasing speeds until one or both cars is unable to successfully complete a pass.

2023 Participating Teams:

Nine teams from six countries (representing 17 universities)

- PoliMOVE – Politecnico di Milano, University of Alabama (Winner of IAC @CES 2022)
- AI Racing Tech (ART) – University of Hawai’i, with University of California, San Diego, Carnegie Mellon University, University of California, Berkeley
- Autonomous Tiger Racing (ATR) – Auburn University
- Black & Gold Autonomous Racing, Purdue University, United States Military Academy at West Point, with Indiana University – Purdue University Indianapolis (IUPUI), Indian Institute of Technology Kharagpur (India), Universidad de San Buenaventura (Colombia)
- Cavalier Autonomous Racing (CAR) – University of Virginia
- KAIST – Korea Advanced Institute of Science and Technology

- MIR-PITT-RW – Massachusetts Institute of Technology, University of Pittsburgh, Rochester Institute of Technology, University of Waterloo
- TII-EuroRacing – University of Modena and Reggio Emilia, Technology Innovation Institute
- TUM Autonomous Motorsport – Technische Universität München

The Racecar:

The official vehicle of the Indy Autonomous Challenge is the [Dallara-built AV-21](#) that has been retrofitted with hardware and controls to enable automation. The Dallara AV-21 chassis is a modified version of the Indy Lights chassis.

- The Dallara AV-21 is a collaboration between Dallara's Italian headquarters in Varano Melegari (Parma) and Dallara IndyCar Factory in Speedway, Indiana.
- The company's success can be credited to its achievements in Formula 3, first in Italy and then around the world. Its American acclaim can be traced to its involvement since 1997 with the NTT IndyCar Series, its consultancy for major manufacturers and its continued focus on technology and innovation.
- Dallara's core competencies include design using carbon fiber composite materials, aerodynamics by means of wind tunnel and CFD (computational fluid dynamics), vehicle dynamics through simulations and testing, and the fast and flexible production of high-quality prototypes.

For more information, visit <https://www.indyautonomouschallenge.com>.

TII-EURORACING

TII-EuroRacing is a global laboratory run by an international team of 14 technologists and engineers from TII's Autonomous Robotics Research Center (ARRC) and the High-Performance Real-Time (HiPeRT) Laboratory at the University of Modena and Reggio Emilia (UNIMORE) in Italy. TII-EuroRacing made its Indy Autonomous Challenge debut in October 2021 at the Indianapolis Motor Speedway to reach the finals with a then-world record of 223 kph for the fastest average lap speed. For more information, visit <https://www.tiieuracing.com/>.

Stats on TII-EuroRacing's Performance:

- ⇒ October 2021 – Indianapolis Motor Speedway: TII-EuroRacing made its IAC racing debut and reached the finals with a then-world record of 223 kph for the fastest average lap speed.
 - ⇒ January 2022 – Las Vegas Motor Speedway: The team clocked a top speed of 272 kph at the first overtaking race for autonomous vehicles.
 - ⇒ November 2022 – Texas Motor Speedway: The team attained a maximum speed of 257.4 km/h and its best lap time of 34.0695 seconds.

Spokesperson: Danilo Caporale, PhD – TII-EuroRacing Team Leader

The Autonomous Robotics Research Center

The Autonomous Robotics Research Center (ARRC) at the Technology Innovation Institute is the region's leading organization advancing robotics, computer vision, and bio-inspired technologies. Its robotics specialization includes perception, communication, control and decision making, bio-inspiration, and modular and self-organized autonomous systems. Applications are explored across multiple environments: air, land, on-sea, and underwater. ARRC's methodology involves fundamental research that draws on: models and simulations, prototype development, testing and validation, and large audience

demonstrations. For more information, visit www.tii.ae/autonomous-robotics.

Spokesperson: Najwa Aaraj, PhD – Acting Chief Researcher, ARRC

Technology Innovation Institute

The Technology Innovation Institute (TII) is the applied research pillar of Abu Dhabi's Advanced Technology Research Council (ATRC). TII is a pioneering global research and development hub that focuses on solving tomorrow's challenges, today. It has ten dedicated research centers in advanced materials, autonomous robotics, cryptography, AI and digital science, directed energy, quantum, secure systems, propulsion and space, biotechnology, and renewable and sustainable energy. By working with exceptional talent, universities, research institutions, and industry partners from around the world, TII connects an intellectual community and contributes to building an R&D ecosystem that reinforces the status of Abu Dhabi and the UAE as a global hub for innovation. For more information, visit www.tii.ae.

Spokesperson: Ray O. Johnson, PhD – CEO, TII and ASPIRE

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>TII CES 2023 Media Kit: <https://ces.vporoom.com/TII>

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Hashtags: #autonomous #autonomousdriving #AV #autonomusracing #CES2023 #IAC