Program

	Monday 21/09	Tuesday 22/09	Wednesday 23/09	Thursday 24/09	Friday 25/09
9:00 – 10:30 (1h30)	Lecture 1 Kinematics & statics Lecturer: M. Carricato	Lecture 4 AI for Kinematics Speaker: J. P. Merlet	Lecture 6 Continuum PKMs Speaker: S. Briot	Lecture 9 Hybrid // Robots Speaker: S. Kumar	Lecture 11 CDPR for Construction Speaker: T. Bruckmann
10:30 – 11.00	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
11:00-12.30 (1h30)	Lecture 2 Kinematics & singularity Speaker: S. Caro	Lecture 5 Design Speaker: O. Company	Lecture 7 Control Speaker: A. Chemori	Lecture 10 Type Synthesis Speaker: X. Kong	Lecture 12 Dynamics Speaker: A. Müller
12:30 – 14:30	Lunch	Lunch	Lunch	Lunch	Lunch & Farewell reception
14:30 – 16:00 (1h30)	Lecture 3 CDPRs Speaker: M. Gouttefarde	Project Simulation lab	Social Event	Project Simulation lab	
16:00 – 16:30	Coffee break	Coffee break		Coffee break	
16:30 – 18:00 (1h30)	Project Simulation lab	Project Simulation lab	Lecture 8 Industry Speaker: SYMETRIE Dinner	Project Simulation lab	

Admission & Registration

The number of participants is restricted to 40. The summer school is open to Ph.D. and Master students, post-docs, engineers, and researchers interested in PKMs.

The registration fees are of **400€**, it includes two steps. A preregistration is required before the **31st of May 2026**, where a scientific committee will select the candidates based on their **CVs**. Accepted participants should proceed to final registration by the **31st of July 2026** on:
http://www.lirmm.fr/pkm-2026/registration/

The registration will include the summer school attendance, lunches on all days, coffee breaks, visit of the company SYMETRIE (specialized in hexapods), copy of the slides of lectures, and a social event. Participants must cover only their own travel and lodging expenses.

Contact

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Sponsorship

IFToMM

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JKU Institut für Robotik

4th Summer School On Parallel Robotics PKM 2026

September 21-25, 2026
Montpellier (France)

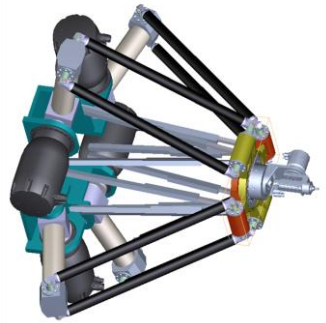

Image: SPIDER4 PKM ©: LIRMM

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www.lirmm.fr/pkm-2026

Parallel Kinematic Machines

The Robotics community has devoted a considerable amount of research efforts on parallel kinematics machines in the past four decades. This interest was motivated by clear performance improvements compared to conventional serial robot architectures, such as anthropomorphic, SCARA or gantry robots. Parallel kinematics systems have demonstrated higher performances in:

- dynamic capabilities in terms of high accelerations (up to 1000 m/s^2 accelerations have been reached by prototypes, pushing the limits of mechanics, control and actuators),
- high payloads, where hexapods can lift today several tons and position them accurately with six degrees of freedom,
- increased stiffness.

The scientific community has addressed many research topics, such as Kinematics, dynamics, singularities, uncertainties, type and dimensional synthesis, control, simulation, calibration, identification, mechanical design, technology, performance indices, reconfigurable devices, and experiments.

A good control of these issues is requested to obtain a convincing running prototype, with potential applications in industry.

As a short list of products that have reached the industrial market, one can mention:

- Hexapods or hexapod-like robots (also known as Gough, Stewart or Gough-Stewart platforms). Among them we can mention some products by PI, Symétrie and or Fanuc,
- Delta or Delta-inspired robots, originally licensed to ABB (Flexpicker), now available from several manufacturers (Fanuc, Codian Robotics, SIG Pack Systems, Panasonic, etc.),
- Tricept (Neos Robotics) and Exechon (Exechon AB),
- Quattro, Hornet (Adept).

Despite the substantial research effort devoted to this domain, only a few products are currently available on the market. The main explanations lie, on the one hand, in the fact that parallel robots can seem complex and require significant analytical investigations to be made operational. On the other hand, the knowledge obtained by academic research often focuses on specific sub-domains and is rarely integrated into comprehensive and readily practical frameworks. Moreover, when prototypes or demonstrators are built, the goal is usually to validate theories through experiments, rather than to convince industrial stakeholders to invest in future products or applications. Nevertheless, some demonstrators meet industrial applications.

From a research point of view, the theory of PKMs has to face technological limitations in terms of:

- industrial control systems,
- active and passive joints integration,
- collision avoidance.

The goal of PKM 2026 is to share the knowledge on parallel kinematic machines design, modelling, control, and other hot topics during a whole week, targeting realistic prototypes and to face real problems met by industry.

The courses are divided in plenary lectures and simulation labs. They are addressed to PhD students, post-docs, engineers, and researchers already involved in the area or interested in parallel kinematic machines. Basic background in mechanical, computer science, control and electrical engineering is appreciated.

Content

Different session formats will be planned:

- plenary lectures by invited international speakers,
- plenary lectures by local speakers and industrials,
- project sessions with simulation labs.

The topics tackled during the sessions include:

- Kinematics and dynamics,
- Control,
- Design,
- Singularities,
- Stiffness,
- Simulation (with Matlab/Adams coupling),
- Special sessions on cable driven parallel robots.

Invited lecturers

Chosen among the most well-known experts worldwide, the lecturers have a significant theoretical and practical background in PKM community:
Marco Carricato, University of Bologna, Italy
Stéphane Caro, Sébastien Briot, LS2N, CNRS, France
Andreas Müller, Johannes Kepler University Linz, Austria
Jean-Pierre Merlet, INRIA, France
Shivesh Kumar, Chalmers University, Sweden
Xianwen Kong, Heriot Watt University, UK
Tobias Bruckmann, Duisburg-Essen University, Germany
Thierry Roux, SYMETRIE Company, France
Ahmed Chemori, **Olivier Company, Marc Gouttefarde,** LIRMM, UM/CNRS, France

Lectures and school materials

All lectures will be given in English. The lecturers' slides will be available online at class time. *The students are advised to bring their own laptop with a running Matlab version and a "student version" of ADAMS software.*

Scientific committee

Andreas Mueller, Johannes Kepler University, Austria
Ahmed Chemori, LIRMM, UM/CNRS, France

ECTS

The 25-hour courses of the Summer School will be accredited by the Doctoral School on Information, Systems and Structure (I2S) of the University of Montpellier (a Doctoral School in the French Universities manages the Ph.D. degree). 4 ECTS credit points will be awarded to student attendees.

Venue & accommodation

All the lectures will be given at Jean-Jacques Moreau Amphitheater, Saint Priest Campus of the university of Montpellier → www.lirmm.fr/pkm-2026/
The attendees should look for their own accommodation in Montpellier.