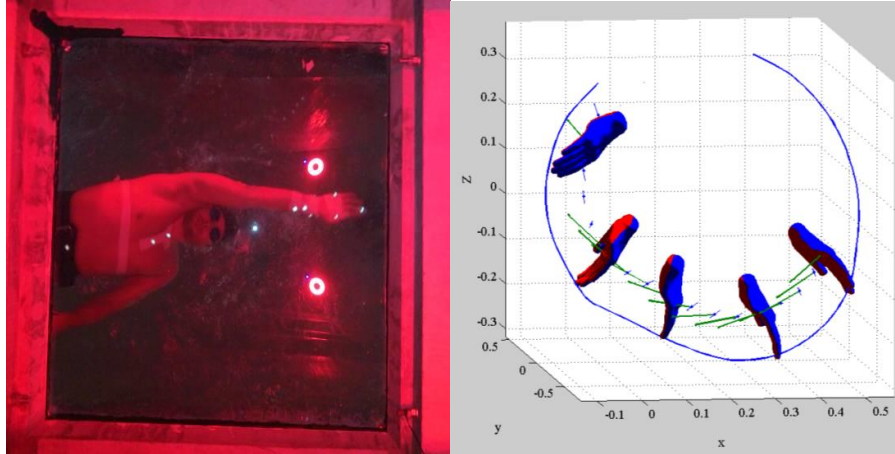


# Kinematic and dynamic coupled measurements in front crawl swimming

This Applied Session is kindly supported by **QUALISYS**  
and **TRINOMA**



## **Abstract**

This applied session will consist of kinematics and dynamics coupled measurements of a tethered swimmer. Kinematic measurements will be made from an optoelectronic system (Qualisys) and will aim to obtain the trajectories and velocities of the hand, wrist, elbow and shoulder, as well as angles of attack and sweepback.

Dynamic measurements will be made from an unsteady dynamometer (Kistler ©) that will measure the forces generated by the swimmer in the forward axis. This coupled method aims to link the propulsion trajectory of the arm and the efforts made to identify the most propulsive instant, but to determine the angles of attack where the resultant force is the most important.

This session will be conducted in the towing tank of the laboratory of the Institute PPRIME.



## **Mathias Samson's bio**

Mathias Samson is an associate professor in physical education at the Faculty of Sport Sciences of the University of Poitiers. He followed, a university program in mechanics which was finalized by the obtaining of the diploma of Master's degree titled « Research and development in Mechanics » of the University of Poitiers. He pursues at present a Doctoral Thesis concerning the understanding of unsteady mechanisms engendered by

the aquatic strokes of arms in crawl, in various paces of swimming.

He is coach of swimming since 15 years, and has notably coached young people at the national level. He handles the formation of students in swimming (theory and practice). His principal research focus is the study of the flow engendered by the movements of the swimmers (in particular the arms), in the various paces. These researches are carried out with modern tools (PIV method, dynamometric balance, towing tank, CFD), within the PPrime Institute.