The Pprime Institut (CNRS, University of Poitiers and ENSMA) organizes the workshop NIM2015 entirely dedicated to non-intrusive measurements applied to unsteady flows and aerodynamics. NIM2015 will be held from October 27th (4 pm) to October 29th (3 pm), 2015 in the IFMI lecture hall (Futuroscope Chasseneuil, France). This workshop is a dissemination activity in the European Framework NIOPLEX (FP7 Non-intrusive Optical Pressure and Loads Extraction for Aerodynamic Analysis, http://nioplex.eu).

NIM2015 gives an opportunity to meet the international community of fluid mechanics working on the optical diagnostics of loads and pressure evaluation with non-intrusive measurements. The fields of interest are unsteady aerodynamics and hydrodynamics, flapping wings, mobile energy recovery systems, animal locomotion and the flow control.

**TOPICS**

- Loads and pressure evaluations with non-intrusive measurements.
- Unsteady flows and aerodynamics.
- Fluid-structure interactions.
- Fluid mechanics applications as flapping wings or mobile energy recovery systems.
- PIV- CFD coupling.

**THREE KEYNOTE LECTURES**

**Dr Protas**, *From the Velocity and Vorticity Fields to Hydrodynamic Forces – A Survey of Mathematical and Computational Approaches*

**Dr Suzuki**, *Hybrid unsteady-flow simulation combining PIV/PTV and DNS: Introduction of data-assimilation algorithms and their capabilities*

**Pr Dickinson**, *How Insects Fly*

**30 ORAL PRESENTATIONS**

**IMPORTANT DATES AND DEADLINES**

Registration deadline: from May 1st to October 16th, 2015
LOCAL ORGANIZING COMMITTEE
- Pr Laurent DAVID, University of Poitiers, Pprime.
- Dr Anthony BEAUDDOIN, University of Poitiers, Pprime.
- Pr Jacques BOREE, ISAE Ensma, Pprime.
- Dr Ludovic CHATELLIER, University of Poitiers, Pprime.
- Dr Thomas EARL, ISAE Ensma, Pprime.
- Dr Thierry JARDIN, ISAE Supaero, DAEP.
- Dr Young Jin JEON, CNRS, Pprime.
- Dr Frederic PONS, ISAE Ensma, Pprime.
- Dr Benoit TREMBLAIS, Université Poitiers, Xlim SIC.
- Dr Christophe SICOT, ISAE Ensma, Pprime.

SECRETARY
Catherine Ecale, University of Poitiers, Pprime
Jocelyne Bardeau, CNRS, Pprime

MAIL
nim2015@ml.univ-poitiers.fr

ADDRESS
NIM2015
Institute of P’, Bâtiment H2
SP2MI - Téléport 2, 11 Boulevard Marie et Pierre Curie,
BP 30179, 86962, Futuroscope Chasseneuil Cedex France


LOCATION
IFMI lecture hall, Futuroscope, France

REGISTRATION
To register, please fill and send the registration form.

FEES
Members of NIOPLEX : free
Non members of NIOPLEX : 150 € (HT) or 180 € (TTC)
**Tuesday October 27th**

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<td>10:00-14:00</td>
<td>Registration</td>
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<td>14:00</td>
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<td>Keynote lecture - 14:15 to 15:00 Load evaluation</td>
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<td><strong>Protas B.</strong> From the Velocity and Vorticity Fields to Hydrodynamic Forces – A Survey of Mathematical and Computational Approaches</td>
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<td><strong>Session 1 - 15:10 to 16:30 - Load evaluation</strong></td>
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<td><strong>Terra W., Sciacchitano A., Scarano F.</strong> On-site drag determination in speed sports by means of large scale tomographic particle image velocimetry – a study of concept.</td>
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<td><strong>Turam E., Fenecrioglu I., Cetiner O.</strong> Identifying circulatory and noncirculatory forces of a flapping foil.</td>
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<td></td>
<td><strong>Jeon Y.J., Chatellier L., Earl T., David L.</strong> Load evaluations from 3D velocity fields applied to the flapping flight.</td>
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<td><strong>Cetiner O.</strong> Loading on a maneuvering Naca0012 airfoil under spanwise gust and estimation of loads using DPIV.</td>
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<td><strong>Session 2 - 16:50 to 18:10 - Unsteady flows</strong></td>
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<td><strong>Mallat B., Germain G., Delacroix S., Druault P., Dussol D., Billard J-Y.</strong> PIV measurements around a bow ship.</td>
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<td><strong>Percin M., Vanierschot M., van Oudheusden B. W.</strong> Experimental investigation of three-dimensional flow structures in annular swirling jets.</td>
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<td><strong>Brouilliot D., Cazin S., Lo Jacono D.</strong> Dynamics and stability of confined impacting jets.</td>
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### Wednesday October 28th

**Keynote lecture - 9:00 to 9:45**

[Suzuki T.](#) **Hybrid unsteady-flow simulation combining PIV/PTV and DNS: Introduction of data-assimilation algorithms and their capabilities**

**Session 3 - 9:55 to 11:15 - Assimilation**

[Lemke M., Westphal C. and Sesterhenn J.](#) **Adjoint based data assimilation in compressible flows with application to pressure determination from PIV data**

[Tissot G., Cordier L. and Noack B. R.](#) **4D-Var identification of DMD Reduced-Order Models.**

[Beaudoin A., Huberson S.](#) **Coupled SPH and PIV for pressure estimation**

[Leroux R., Chatellier L., David L.](#) **Time-resolved flow reconstruction using Kalman filtered and PLSR**

**Session 4 - 11:35 to 12:35 - Fluid-Structure Interactions**

[Bleischwitz R., de Kat R., Ganapathisubramani B.](#) **Fluid-structure Interaction of Membrane Wings in Ground Effect**

[Scheller J., Rizzo KJ., Jodina S., Marchal M., Duhayon E., Rouchon JF., Brazza M.](#) **PIV measurements of a high-frequency vibrating trailing edge morphing NACA4412 airfoil**

[Barbu A., de Kat R., Ganapathisubramani B.](#) **Aero-electro-mechanical Coupling of Electro-Active Membrane Wings**

**Session 5 - 14:00 to 15:40 – Pressure evaluation**

[Auteri F., Carini M., Droandi G., Gibertini G., Zagaglia D., Zanotti A.](#) **Pressure field around a helicopter rotor blade from PIV surveys**

[McPhaden C.J., Rival D.E.](#) **Pressure extraction from Lagrangian flow measurements of a vanishing wing**

[Blinde P.L., Gentile V., van Oudheusden B.W., Schrijer F.F.J.](#) **Determination of instantaneous pressure fields in a low-speed axisymmetric base flow based on time-resolved tomographic PIV**

[Van Der Kindere J., De Kat R.](#) **Pressure around forward–backward facing steps of various length**

[Huhn F., Schanz D., Gesemann S., Schröder A.](#) **Pressure fields from high-resolution time-resolved particle tracking velocimetry in 3D turbulent flows**

**Session 6 - 16:00 to 17:00 - Unsteady flows**

[Simonini A., Regert T., Vettrano M.R.](#) **PIV applied to lateral sinusoidal sloshing: comparison with OpenFoam simulations.**

[Widmann A., Tropea C.](#) **3D Using flow topology and finite time Lyapunov exponent to characterize two forms of leading edge vortex detachment**


**Keynote lecture - 18:00 to 19:00 City town: Espace Mendès France (open to the public)**

[Dickinson M.](#) **How Insects Fly**
Thursday October 29th

Session 7 - 9:00 to 10:20 – Pressure evaluation

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<td>Schneiders JFG., Alp Caridi GC., Sciacchitano A., Scarano F.</td>
<td>Large-Volume Instantaneous Pressure from Tomographic PTV using HFSB Tracers</td>
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<td>Günaydınoglu E., Kurtulus D.F.</td>
<td>Two dimensional pressure field determination on flapping flat plate from PIV measurements</td>
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<td>Tagliabue A., Bitter M., Kähler CJ.</td>
<td>Planar pressure field reconstruction from ensemble PIV using PSP surface pressure boundary conditions</td>
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<td>Nguyen V.T., Tremblais B., Pons F., David L.</td>
<td>Pressure evaluation by polynomial basis</td>
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Session 8 - 10:40 to 12:10 - Unsteady flows

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<td>Senol M.G., Comez F. Y., Kurtulus D. F., Arikan K. B.</td>
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<td>Jardin T., Jeon YJ , David L.</td>
<td>Flow analysis of a flapping wing for symmetrical and assemtrical kinematics</td>
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<tr>
<td>Comez YF., Senol MG., Kurtulus DF., Arikan KB.</td>
<td>Unsteady Aerodynamic Analysis of a Flapping Wing Actuated with PZT Material.</td>
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<td>Gorle J.M.R., Chatellier L., Pons F., Ba M.</td>
<td>PIV investigation of the flow across a Darrius water turbine</td>
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End of the Workshop