# Day 3 - Friday, November 6

| | Session 10 (chair: Albert Cohen) |
|---|---|
| 08:30 – 09:05 | **Keynote:** Hermann G. Matthies<br><br>Construction of Reduced Order Models via Bayesian Identification |
| 09:05 – 09:40 | **Keynote:** Didier Mazon<br><br>Challenges in Tokamak control and links with measurements and actuators |
| 09:40 – 10:05 | **Invited technical paper:** Florian De Vuyst<br><br>Time-dependent problem solvers: a survey of IMEX, LATIN, PARAEXP and PARAREAL algorithms, and use of exponential integrators and other ROMs |
| 10:05 – 10:30 | **Invited technical paper:** Anthony Gravouil, David Dureisseix, Anthony Giacoma, Michel Rochette<br><br>Multi-scale acceleration techniques for non-linear analysis of structures with frictional contact |
| 10:30 – 11:00 | **Coffee break** |

| | Session 11 (chair: Hermann G. Matthies) |
|---|---|
| 11:00 – 11:25 | **Invited technical paper:** Gianluigi Rozza<br><br>Recent advances and perspectives on Model Order Reduction in CFD |
| 11:25 – 11:50 | **Invited technical paper:** Anthony Nouy, Olivier Zahm<br><br>Preconditioners for parameter-dependent equations and goal-oriented model order reduction |
| 11:50 – 12:15 | **Invited technical paper:** Athanasios C. Antoulas<br><br>Data-driven model reduction in the Loewner framework. |
| 12:15 – 12:40 | **Invited technical paper:** Pedro Díez, Sergio Zlotnik, Antonio Huerta<br><br>Error in arising from the separation of input data in PGD: a priori estimates and implementation best practices |
| 12:40 – 13:00 | **Technical paper:** Jose Paulo Moitinho de Almeida, Carlos Tiago<br><br>PGD solutions for Kirchhoff plates on an elastic foundation: Error bounds and other issues |
| 13:00 – 14:30 | **Lunch and End of the Workshop** |

# Poster Session

**Pierre-Eric Allier**, Ludovic Chamoin, Pierre Ladevèze
PGD driven by the Constitutive Relation Error - Minimal CRE/PGD

**Benjamin Brands**, Julia Mergheim, Paul Steinmann
Reduced-Order Modelling using Nested POD

**Nicolas Bur**, Pierre Joyot, Francisco Chinesta, Pierre Villon
Optimal control for heat equation using PGD

**Ba Trung Cao**, Steffen Freitag, Günther Meschke
Hybrid RNN-GPOD surrogate model for real-time simulations with uncertain data in mechanised tunnelling

**Amaury Courard**, David Néron, Pierre Ladevèze, Alain Bergerot, Ludovic Ballere
Engineering structural design and optimization through PGD-virtual charts

**Pierre Despret**, Jean-Luc Dulong, Pierre Villon
A new way to solve the heat equation with PGD

**Felix Fritzen**, Matthias Leuschner, Liang Xia
Nonlinear multi-scale topology optimization using the FE2 Reduced (FE2R) method

**Raquel García-Blanco**, Pedro Díez, Domenico Borzacchiello, Francisco Chinesta
LATIN-PGD Solver for the Electric Grids Power Flow Problem

**Christian Gogu**
Topology optimization with millions of design variables aided by reduced order modeling

**Dennis Grunert**, Jörg Fehr
Identification of nonlinear behavior with clustering techniques in car crash simulations for better model reduction

**Thomas Henneron**, Stéphane Clénet
PGD and (D)EI methods apply to solve non-linear magnetostatic Problems coupled with electric circuit equations

**Martin Horák**, Samuel Forest, David Ryckelynck, Djamel Missoum-Benziane
Order reduction models and generalized continua

**Alexandre Janon**, Maëlle Nodet, Clémentine Prieur
Goal-oriented error estimation for the reduced basis method, Application to sensitivity analysis

**Maxime Jessus**, David Néron, Pierre Ladevèze
PGD-models for Lack-of-Knowledges' prediction in nonlinear structural problems

**Ettore Lappano**, Franck Naets, Martijn Vermaut, Domenico Mundo, Wim Desmet
Application of Parametric Model Order reduction to beam-based structures

**Liang Meng**, Piotr Breitkopf, Balaji Raghavan, Gérard Mauvoisin, Olivier Bartier, Xavier Hernot
Identification of material properties using indentation test and shape manifold learning approach

**Laurent Montier**, Thomas Henneron,, Stéphane Clénet, Benjamin Goursaud
Reduction of Finite Element Model of a rotating electrical machine

**Mohamed A. Nasri**, Camille Robert, Saber El Arem, Franck Morel, Amine Ammar
Proper Generalized Decomposition (PGD) for numerical calculation of polycrystalline aggregates under cyclic loading

**Yannick Paquay**, Olivier Brüls, Christophe Geuzaine
Model Order Reduction of Nonlinear Magnetodynamics with Manifold Interpolation

**Matthieu Vitse**, Pierre-Alain Boucard, David Néron
Seismic structural problems: damage prediction and its variability through PGD-models

**Liang Xia**, Piotr Breitkopf
Multiscale structural topology optimization with an approximate constitutive model for local material microstructure

# Programme

# Day 1 - Wednesday, November 4

| 08:30 – 08:45 | **Opening**<br><br>Pierre-Paul Zalio (President of ENS Cachan), Pierre Ladevèze, Francisco Chinesta |
|---|---|

| | Session 1 (chair: Francisco Chinesta) |
|---|---|
| 08:45 – 09:20 | **Keynote:** Yvon Maday<br><br>A new concept of reduced basis approximation for convection dominated problems |
| 09:20 – 09:55 | **Keynote:** Karen Willcox<br><br>Data-Driven Model Reduction to Support Decision Under Uncertainty |
| 09:55 – 10:15 | **Technical paper:** Roxana Crisovan, Rémi Abgrall, David Amsallem<br><br>Robust Model Reduction by L1-norm Minimization and Approximation via Dictionaries: Application to Linear and Nonlinear Hyperbolic Problems |
| 10:15 – 10:45 | **Coffee break** |

| | Session 2 (chair: Karen Willcox) |
|---|---|
| 10:45 – 11:10 | **Invited technical paper:** Bernard Haasdonk, Markus Dihlmann<br><br>A Reduced Basis Kalman Filter for Certified and Rapid State Estimation of Parametrized PDEs |
| 11:10 – 11:35 | **Invited technical paper:** David Ryckelynck<br><br>Model calibration by using hyper-reduction in statics and dynamics of elastoplastic materials |
| 11:35 – 12:00 | **Invited technical paper:** Joaquin A. Hernandez, Javier Oliver<br><br>Dimensional hyperreduction of nonlinear parameterized models |
| 12:00 – 12:20 | **Technical paper:** Andrea Manzoni, Stefano Pagani<br><br>A reduced-order framework for the efficient solution of inverse Uncertainty Quantification problems |
| 12:20 – 12:40 | **Technical paper:** Patrick Héas, Cédric Herzet<br><br>Inverse Reduced-Order Modeling |

# Day 1 - Wednesday, November 4

| | |
|---|---|
| 12:40 – 14:15 | **Lunch** |

## Session 3 (chair: Antonio Huerta)

| | |
|---|---|
| 14:15 – 14:50 | **Keynote: Philip Avery, Todd Chapman, Charbel Farhat** <br> Dimensional Reduction of Nonlinear Deformable Dynamic Contact Problems |
| 14:50 – 15:25 | **Keynote: Pierre Ladevèze** <br> Reduced Models in Nonlinear Solid Mechanics: State of the Art and Challenges |
| 15:25 – 15:45 | **Technical paper: Serge Prudhomme, Kenan Kergrène, Marc Laforest** <br> PGD formulations for interface problems |

| | |
|---|---|
| 15:45 – 16:00 | **Break** |

## Session 4 (chair: Bernard Haasdonk)

| | |
|---|---|
| 16:00 – 16:25 | **Invited technical paper: Antonio Huerta** <br> Domain decomposition for in-plane/out-of-plane model reduction approaches by the Proper Generalized Decomposition |
| 16:25 – 16:50 | **Invited technical paper: Elias Cueto** <br> Manifold learning techniques for shape characterization and interpolation |
| 16:50 – 17:10 | **Technical paper: Timoleon Kipouros, Andoni Agirre-Mentxaka, Marco Hahn** <br> Historic data mapping for aircraft computational design |
| 17:10 – 17:30 | **Technical paper: Boyan S. Lazarov** <br> Topology optimization under manufacturing uncertainties using reduced order models |

| | |
|---|---|
| 18:45 – 20:15 | **Visit of Louvre museum** |
| 20:30 – 23:00 | **Diner at Saint James Albany Restaurant** <br> (202 Rue de Rivoli, 75001 Paris, close to Louvre museum) |

# Day 2 - Thursday, November 5

## Session 5 (chair: Alfio Quarteroni)

| | |
|---|---|
| 08:30 – 09:05 | **Keynote: Francisco Chinesta** <br> Computational vademecums for large industrial applications |
| 09:05 – 09:45 | **Keynote: A. Radermacher, Stephanie Reese, Brett Bednarcyk** <br> Displacement-based multiscale modeling and substructuring by means of POD |
| 09:45 – 10:10 | **Invited technical paper: Claude Lebris** <br> Reduced order models (and beyond) for the optimization of microstructures in materials science |
| 10:10 – 10:35 | **Invited technical paper: Ramon Codina, Joan Baiges, Sergio Idelsohn** <br> Dynamic reduced order subscales for POD models in fluid mechanics |

| | |
|---|---|
| 10:35 – 11:00 | **Coffee break** |

## Session 6 (chair: Stephanie Reese)

| | |
|---|---|
| 11:00 – 11:25 | **Invited technical paper: Sergio Idelsohn, Julio Marti, Norberto Nigro** <br> Enriched spaces: a class of Reduced Order Model for problems with moving interfaces |
| 11:25 – 11:50 | **Invited technical paper: David Néron, Pierre-Alain Boucard, Pierre Ladevèze** <br> PGD-Reduced Models for several parametrized nonlinear problems |
| 11:50 – 12:15 | **Invited technical paper: David Amsallem, Bernard Haasdonk** <br> Nonlinear Model Reduction Using hp-Local Reduced-Order Bases |
| 12:15 – 12:40 | **Technical paper: Michel Visonneau** <br> A new PGD-based time space decomposition for the unsteady Navier-Stokes equations applied to incompressible flows |

# Day 2 - Thursday, November 5

| | |
|---|---|
| 12:40 – 14:15 | **Lunch** |

## Session 7 (chair: Charbel Farhat)

| | |
|---|---|
| 14:15 – 14:50 | **Keynote: Albert Cohen** <br> Data assimilation in reduced modeling |
| 14:50 – 15:25 | **Keynote: Alfio Quarteroni,** <br> DGRBE (Discontinuous Galerkin Reduced Basis Element) methods for PDEs on partitioned domains |
| 15:25 – 15:50 | **Invited technical paper: Abdallah El Hamidi** <br> On the PGD for non-smooth variational problems |
| 15:50 – 16:10 | **Technical paper: Kevin Carlberg, Matthew Barone, Harbir Antil** <br> Discrete-optimal projection in nonlinear model reduction |

| | |
|---|---|
| 16:10 – 16:40 | **Break** |

## Session 8 (chair: Gianluigi Rozza)

| | |
|---|---|
| 16:40 – 17:05 | **Invited technical paper: Amine Ammar, Francisco Chinesta, Elias Cueto** <br> Chemical Master Equation: Separated representation resolution and empirical moment-closures |
| 17:05 – 17:30 | **Invited technical paper: Piotr Breitkopf, Pierre Villon** <br> Shape manifold approach for reduced order modeling in optimization, springback quantification and inverse analysis |

## Session 9

| | |
|---|---|
| 17:30 – 21:00 | **Poster presentation: Yvon Maday, Pierre Villon** <br> <br> Posters, Wines and Cheeses |