

Scientific Resume

Sofiane KHELLADI, PhD

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Citizenship : France

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Associate Professor
at Arts et Métiers ParisTech since 2006

PROFESSIONAL ADDRESS:

Arts et Métiers ParisTech
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Education

- 2012 **Habilitation à Diriger des Recherche - Mechanical engineering**
Université Pierre et Marie CURIE, Paris, France.
- 2005 **PhD - Mechanical engineering**
Arts et Métiers ParisTech, Paris, France.
- 2003 **Master of science - Energy conversion**
Université Pierre et Marie CURIE, Paris, France.
- 1999 **Engineer - Mechanical engineering**
Ecole Polytechnique d'Alger, Algeria.

Computer skills

Word processing: L^AT_EX, OpenOffice, MS Office.
Scientific and professional codes: *Non-free* – Matlab, Fluent/Gambit, StarCCM+, SolidWorks,
 Catia, Maple, Tecplot.
 Free – Scilab, Salomé, Paraview, GMSH.
Programming languages : C/C++ (Lib. : OpenMP, OpenMPI, SUNDIALS, OpenGL, Petsc,
 OpenCascade, Qt, WxWidget,...), Fortran, VB, Python,...
 IDE – Code::Blocks, Qt Creator, C++ Builder/Delphi.

Research activity

Research interest

- Computational fluid dynamics: Advanced numerical methods for complex fluid systems.
- Modelling of multiphase flows, with and without transfers.
- Aero-hydrodynamics and acoustics modelling of subsonic turbomachines.

PhD thesis supervision

► Finished

[TH1] Monir ASGARPOUR – Étude de la densification des particules et la migration des bulles d'air lors du rotomoulage des pièces aérodynamiques. Arts et Métiers ParisTech, soutenue le 10/11/2010.

[TH2] Hakim ELHADJEN – Étude de propagation acoustique dans les turbomachines subsoniques : Développement d'une méthode volumes finis d'ordre élevés basée sur une approximation par moindres carrés mobiles. Arts et Métiers ParisTech, soutenue le 14/12/2010.

[TH3] Moises SOLIS – Analyse Numérique et Expérimentale des Fluctuations de Pression dans les Turbomachines Centrifuges et Axiales. Arts et Métiers ParisTech, soutenue 14/12/2011.

[TH4] Belkhir NOURA – Étude comparative d'une Modélisation RANS multiformes d'un écoulement 3D autour d'un Rotor éolien à axe horizontal (HAWT) en phase du décrochage dynamique. ENSAM/USTHB Algérie, soutenue le 17/01/2012.

[TH5] Vianney ATIM – Stockage thermique pour la réduction des émissions et de la consommation : étude numérique et expérimentale d'un séparateur de phases et optimisation du fonctionnement du système. CIFRE Renault, la soutenue le 22/03/2012.

[TH6] Sylvain RIVIERE – Optimisation et simulation du rotomoulage réactif. Arts et Métiers ParisTech, LIMM, soutenue le 05/12/2012.

[TH7] Lionel BERGERAT – Développement d'une méthode numérique compressible pour la simulation de la cavitation en géométrie complexe Arts et Métiers ParisTech, soutenue le 17/12/2012.

[TH8] Elias TANNOURY – Contribution à la prévision de bruit tonal des machines tournantes subsoniques : couplage des simulations numériques et des modèles analytiques avec les analogies acoustiques CIFRE VALEO, 2010-2013, soutenue le 05/07/2013.

► In progress

[TH9] Ewen MARECHAL – Modélisation du givrage et du transport de givre dans les fluides thermosensibles. CIFRE SNECMA, 2011-2014.

[TH10] Petar TOMOV – Modélisation de la rétroaction cavitation/dégazage du carburant dans les inducteurs aéronautique. CIFRE SNECMA, 2013-2016.

[TH11] Tafarines AIT-ALI – Modélisation et simulation numérique avancées de la cavitation pour une meilleure prise en compte du collapse. Arts et Métiers ParisTech, 2013-2016.

[TH12] Sylvain PARRANG – Analyse et modélisation aéroacoustique des moteurs électriques à très haute vitesse de rotation. ENS-CACHAN, 2013-2016.

[TH13] Charles FOULQUIE – Aéroacoustique des turbomachines subsoniques : Prise en compte effective des parties mobiles dans le milieu de propagation par une méthode de maillage glissant haute résolution. CIFRE SNECMA, début 2014.

Scientific publications

► PhD thesis :

[T1] KHELLADI S., "Contribution à la modélisation aéroacoustique des ventilateurs centrifuges à grande vitesse", Thèse de doctorat d'Arts et Métiers ParisTech, 2005.

► HDR thesis :

[T2] KHELLADI S., "Modélisation et simulation numérique avancée pour l'analyse et le contrôle des systèmes fluides complexes", Habilitation à Diriger des Recherches, UPMC, 2012.

► Research papers :

Advanced numerical methods using high order finite volume method for unstructured grid

[A1] Nogueira X., Colominas I., Cueto-Felgueroso L., Khelladi S., Navarrina F., Casteleiro M., "Resolution of Computational Aeroacoustics problems on unstructured grids with a higher-order finite volume scheme", *Journal of Computational and Applied Mathematics*, vol. 234/7, pp.2089-2097, 2010 (online since 2009).

[A2] Nogueira X., Colominas I., Cueto-Felgueroso L., Khelladi S., "On the simulation of wave propagation with a higher-order finite volume scheme based on Reproducing Kernel Methods", *Computer Methods in Applied Mechanics and Engineering*, vol. 199, pp. 1471-1490, 2010.

[A3] Nogueira X., Khelladi S., Cueto-Felgueroso L., Bakir F., Colominas I., Gomez H., "Implicit Large-Eddy Simulation with a Moving Least Squares-based finite volume method", *IOP Conf. Series : Materials Science and Engineering*, vol. 10/ 012235, 2010.

[A4] Khelladi S., Nogueira X., Bakir F., Colominas I., "Toward a Higher-Order Unsteady Finite Volume Solver Based on Reproducing Kernel Particle Method", *Computer Methods in Applied Mechanics and Engineering*, vol. 200, pp. 2348-2362, 2011.

[A5] Nogueira X., Khelladi S., Cueto-Felgueroso L., Colominas I., PARIS J., Gomez H., "High-resolution finite volume methods on unstructured grids for turbulence and aeroacoustics", *Archives of Computational Methods in Engineering*, vol. 18/3, pp 315-340, 2011.

[A6] Chassaing J.-C., Nogueira X., Khelladi S., "Moving Kriging reconstruction for high order finite volume computations of compressible Flows", *Computer Methods in Applied Mechanics and Engineering*, vol. 253, 463-478, 2013.

[A7] Chassaing J.C., Khelladi S., Nogueira X., "Accuracy assessment of a high-order moving least squares finite volume method for compressible flows", *Computers and Fluids*, vol. 71, 41-53, 2013

[A8] Ata R., Pavan S. Khelladi S., Toro E.F., "A Weighted Average Flux (WAF) scheme applied to shallow water equations for real-life applications", *Advances in Water Resources*, accepted for publication in 2013, DOI: <http://dx.doi.org/10.1016/j.adwa.2013.08.001>

Multiphase flows with and without transfers

[A9] Campos-Amezcuca R., Khelladi S., Bakir F., Czerwiec Z.M., Sarraf C., Rey R., "Numerical Analysis of Unsteady Cavitating Flow in an Axial Inducer", *Journal of Power and Energy*, vol. 224/2, pp. 223-238, 2010.

[A10] Asgarpour M., Bakir F., Khelladi S., Khavandi A., Tcharkhtchi A., "Characterization and modeling of sintering of polymer particles", *Journal of Applied Polymer Science*, vol. 119/5, pp. 2784-2792, 2011 (online since 2010).

[A11] Asgarpour M., Bakir F., Khelladi S., Khavandi A., Tcharkhtchi A., "3D Model for Powder Compact Densification in Rotational Molding", *Journal of Polymer Engineering and Science*, vol. 52/9, pp. 2033-2040, 2012.

- [A12] Ravelet F., Bakir F., Khelladi S., Rey R., "Experimental study of hydraulic transport of large particles in horizontal pipes", *Experimental Thermal and Fluid Science*, Vol. 45, pp. 187-197, 2013.
- [A13] Rivière S., Khelladi S., Farzaneh S., Bakir F., Tcharkhtchi A., "Simulation of Polymer Flow using Smoothed Particle Hydrodynamics Method", *Polymer Engineering & Science*, accepted for publication in 2013.
- [A14] Zaaraoui A., Ravelet F., Margnat F., Khelladi S., "A High Accuracy Volume Flow Rate Measurement Using Vortex Counting", *Flow Measurement and Instrumentation*, Vol. 33, October 2013, Pages 138–144.
- [A15] Campos–Amezcuca R., Khelladi S., Mazur-Czerwicz Z., Bakir F., Campos-Amezcuca A., Rey R., "Numerical and experimental study of the cavitating flow through an axial inducer considering the tip clearance", *Journal of Power and Energy*, Published online before print August 28, 2013, doi: 10.1177/0957650913497357.

Aero-hydrodynamics and acoustics of subsonic turbomachines

- [A16] Khelladi S., Kouidri S., Bakir F., Rey R. "Flow Study in the Impeller-Diffuser Interface of a Vaned Centrifugal Fan", *ASME Journal of Fluids Engineering*, 127 , pp. 495, 502 - 2005.
- [A17] Khelladi S., Kouidri S., Bakir F., Rey R., "Predicting Tonal Noise from a High Speed Vaned Centrifugal Fan", *Journal of Sound and Vibration*, vol. 313/1-2, pp. 113-133, 2008.
- [A18] Khelladi S., Kouidri S., Rey R., "Isom's Thickness Noise for Axial and Centrifugal Subsonic Fans", *Journal of Sound and Vibration*, vol. 313/1-2, pp. 1-6, 2008.
- [A19] Khelladi S., Sarraf C., Bakir F., Rey R., "Study of a High Rotational Speed Shrouded Centrifugal Fan : Aerodynamics and Effects of shroud associated cavity on the Performance", *Journal of Power and Energy*, 224/5, pp. 691-700, 2010 (online since 2009).
- [A20] Khelladi S., Bakir F., "A Consistency Test of Thickness and Loading Noise Codes Using Ffowcs Williams and Hawkings Equation", *Advances in Acoustics and Vibrations*, vol. 2010, Article ID 174361, 6 pages, 2010.
- [A21] Solis. M., Bakir F., Khelladi S., Noguera R., "Numerical Study on Pressure Fluctuations Reduction in Centrifugal Pumps : Influence of Radial Gap and Splitter Blades", *ISRN Mechanical Engineering*, vol 2011, Article ID 479594, 14 pages, 2011.
- [A22] Obikane Y., Khelladi S., "Instability Problem of Turbo-Machines with Radial Distortion Problems", *World Academy of Science, Engineering and Technology*, vol. 77, pp. 1101-1103, 2011.
- [A23] Eleiwi F., Laleg-Kirati T.-M., Khelladi S., Bakir F., "A Semi-Classical Signal Analysis Method for the Analysis of Turbomachinery Flow Unsteadiness", *World Academy of Science, Engineering and Technology*, vol. 59, pp. 215-218, 2011.
- [A24] Noura B., Dizène R., Khelladi S., "A Numerical Simulation of Turbulence Flow around a Blade Profile of HAWT Rotor in Moving Pulse", *Journal of Applied Fluid Mechanics*, vol. 5/1, pp. 1-9, 2012.
- [A25] B. Noura, I. Dobrev, R. Dizène, F. Massouh, S. Khelladi, "Experimental study of yawed inflow around horizontal wind turbine rotor", *Journal of Power and Energy*, vol. 226/5, pp. 664-673, 2012.
- [A26] Tannoury E., Khelladi S., Demory B., Henner M., Bakir F., "Tonal Noise Prediction of an Automotive Engine Cooling Fan: Comparison between Analytical Models and Acoustic Analogy Results", *Journal of Mechanics Engineering and Automation*, Vol. 2, pp. 455-463, 2012.
- [A27] Tannoury E., Khelladi S., Demory B., Henner M., Bakir F. "Influence of blade compactness and segmentation strategy on tonal noise prediction of an automotive engine cooling fan", *Applied Acoustics*, Vol. 74, Issue 5, pp. 782-787, 2013.
- [A28] Noura B., Khelladi S., Dizène R., Bakir F., "Numerical Simulation of Dynamic Stall and Surface Roughness of a Wind Turbine Blade Using a URANS Approach", *Journal of Power and Energy Systems*, Vol.7, Issue 1, pp. 32-48 2013.

Book chapters

[CL1] R. Campos-Amezcuca, F. Bakir, Z. Mazur, S. Khelladi, A. Campos-Amezcuca, "Numerical and experimental study of mass transfer through cavitation in turbomachinery", InTec, Mass Transfer/Book 3, ISBN 978-953-308-74-5

[CL2] S. Khelladi, C. Sarraf, F. Bakir, R. Rey, "Aerodynamic and aeroacoustic study of a high rotational speed centrifugal fan", InTec, Aerodynamics, ISBN 979-953-307-395-7, 2012

[CL3] Nogueira X., Khelladi S., Colominas I., Bakir F., Chassaing J.-C., "On the use of Moving Least Squares for pressure discretization in low Mach number flows", Numerical Methods for Hyperbolic Equations Theory and Applications, CRC Press, 2012 accepted for publication.

Technical report

[TI1] Rey R., Bois G., Bakir F., Khelladi S. "Turbomachines : calcul des écoulements incompressibles - Support théorique et simulation numérique ", Techniques de l'Ingénieur, Référence BM4220, Date de publication : 10 oct. 2009

Vulgarisation articles

[V1] Tcharkhtchi A., Khelladi S., Rey R., "Flow of Liquid Reactive Polymers During Rotational Moulding", Rotation, volume XIII, issue 1, pp. 45-47 , January - February 2004

[V2] S. Rivière, S. Khelladi, S. Farzaneh, F. Bakir, A. Tcharkhtchi, F. Nony, Ph. Mazabraud, Simulation de l'écoulement d'un liquide réactif au cours du rotomoulage, Choc Focus n°2 juillet 2011, La chimie CEA/DAM, pp. 28-29, 2011

Patents

[B1] V. Atim, B. , R. Yu, B. Popineau, Bakir F., Khelladi S., "Séparateur de phase et procédé de séparation correspondant", date de publication 20-09-2013, ref. FR2988013.

Communications

► International communications:

[C1] Khelladi S.(*), Kouidri S., Bakir F., Rey R. "Optimization of 3D unsteady fluid flow in multistage centrifugal fan", ASME Fluids Engineering Forum - FEDSM04 - HT-FED2004-56792, Charlotte, USA.

[C1] Khelladi S., Kouidri S., Bakir F., Rey R. "A Numerical Study on the Aeroacoustics of a Vaned Centrifugal", ASME Fluids Engineering Summer Conferences - June 19-23, 2005, Houston, Texas, USA - FEDSM2005-77134.

[C1] Khelladi S., Kouidri S., Rey R. "Isom's Thickness Noise Formula for Axial and Centrifugal Subsonic Fans", Inter-Noise 2007, 28-31 AUGUST 2007, ISTANBUL, TURKEY.

[C1] Khelladi S., Cao R., Noguera R., S. Kouidri, F. Bakir, R. Rey, "Effects of Tip Clearance on the Performance and the Flow Field of a High Rotational Speed Centrifugal Fan", Proceedings of COBEM 2007, 19th International Congress of Mechanical Engineering November 5-9, 2007, Brasília, DF

[C1] Campos-Amezcuca R., Bakir F., Khelladi S., Rey R., "Numerical Study of the Unsteady Cavitating Flow", 12th International Symposium on Transport Phenomena and Dynamics of Rotating Machinery - February, 12-22, 2008, Honolulu, Hawaii.

[C1] Nogueira X., Cueto-Felgueroso L., Colominas I., Khelladi S., Navarrina F., Casteleiro M., "A numerical approach based on Moving Least Squares approximations for the resolution of acoustic problems on unstructured grids", Advanced

[C1] Khelladi S., Bakir F., Rey R., "Validation of Thickness and Loading Noise Codes by Isom's Formula Applied to Subsonic Axial and Centrifugal Fans", Acoustics08, Paris, 2008, COUSTICS2008/584, J. Acoust. Soc. Am. 123, 3537 (2008)

[C1] Khelladi S., Nogueira X., Bakir F., Cueto-Felgueroso L., Colominas I., "Finite Volume Solvers and Moving Least Square Approximations for the Linearized Euler Equations on Unstructured Grids", Acoustics08, Paris, 2008, ACOUSTICS2008/589, J. Acoust. Soc. Am. 123, 3381 (2008)

[C1] Asgarpour M., Bakir F., Khelladi S., Tcharkhtchi A., "Particle sintering and migration of bubbles during rotational molding of aerodynamic parts", Rotomoulding, Thermoforming and Stretch-Blow Moulding, 11-13 March, Albi, France, 2009.

[C1] Campos-Amezcuca R., Bakir F., Khelladi S., Rey R., "Numerical and Experimental Analysis of Cavitating Flow in an Axial Inducer with/without Tip-Clearance", 8th European Conference on Turbomachinery Fluid Dynamics and Thermodynamics, Graz, Austria, 23-27 March, pp. 183-195, 2009.

[C1] Khelladi S., El Hadhen H., Nogueira X., Bakir F., Ouadjaout M., "Toward a High Order Unsteady Finite Volume Solver Based on Moving Least Squares Approximation Method : Application to Aeroacoustic Problems", The IMACS World Congress on Computational and Applied Mathematics & Applications in Science and Engineering, August 3-5, 2009, Athens, GA, USA.

[C1] Solis. M. , Bakir F., Khelladi S. , "Pressure Fluctuations Reduction in Centrifugal Pumps: Influence of Impeller Geometry and Radial Gap", ASME Fluids Engineering Division Meeting (FEDSM2009), August 2-6, 2009, Vail, Colorado, USA.

[C1] Moon Y.J., Kim H., Bae Y., Ravelet F., Khelladi S., Nouri H., Bakir F., "Prediction of axial fan noise by linearized perturbed compressible equations with large eddy simulation", THE JOINT 159TH MEETING OF THE ACOUSTICAL SOCIETY OF AMERICA/NOISE-CON 2010, J. Acoust. Soc. Am. Volume 127, Issue 3, pp. 1837-1837, 19-23 April 2010. Baltimore.

[C1] Asgarpour M., Bakir F., Khelladi S., Tcharkhtchi A., "Sintering of polymer powders", BYPOS 2010, Trencianske Teplice (Slovakia), 7-10 June 2010.

[C1] Khelladi S., Martin S., Nogueira X., Bakir F., "Higher- Order Preserving Methods for Unsteady Finite Volume Solvers Based on Reproducing Kernels: Application to Aeroacoustic Problems", AIAA-2010-3817, 16th AIAA/CEAS Aeroacoustics Conference, 7-9 June 2010 Stockholm, Sweden.

[C1] Ravelet F., Khelladi S., Nouri H., Bakir F., Kim H., Bae Y., Moon Y.J., "Study of the Aerodynamics/Aeroacoustics of an Axial- Flow Fan: Experimental Validation of a LES/LPCE/Brinkman Penalization Method", AIAA-2010-3869, 16th AIAA/CEAS Aeroacoustics Conference, 7-9 June 2010 Stockholm, Sweden.

[C1] Nogueira X., Khelladi S., Cueto-Felgueroso L., Bakir F., Colominas I., Gomez H., "Implicit Large-Eddy Simulation with a Moving Least Squares-based finite volume method", 9th World Congress on Computational Mechanics, 19-23 July 2010, Sydney, Australia.

[C1] S. Khelladi, X. Nogueira, H. El-Hadjen, I. Colominas, F. Bakir, M. Casteleiro, "Application of a high-order finite volume method to aeroacoustic problems of industrial interest", Mecánica Computacional, Volume XXIX. Number 35. Fluid Mechanics (D), Buenos Aires, Argentina, 15-18 Noviembre 2010.

[C1] R. Campos-Amezcuca, F. Bakir, S. Khelladi, L. Bergerat , Z. Mazur-Czerwicz, R. Rey, Numerical study of unsteady cavitating flow in a three-dimensional axial inducer, 9th EUROPEAN CONFERENCE ON TURBOMACHINERY, Fluid Dynamics and Thermodynamics, 21 - 25 March 2011, Istanbul, Turkey.

[C1] E. Tannoury , B. Demory, M. henner, S. Khelladi, F. Bakir, Tonal Noise Prediction of an Automotive Engine Cooling Fan: ComParison Between Analatical Models and Acoustic Analogy Results, 9th EUROPEAN CONFERENCE ON TURBOMACHINERY, Fluid Dynamics and Thermodynamics, 21 - 25 March 2011, Istanbul, Turkey.

[C1] L. Ramirez, X.Nogueira, S. Khelladi, J.C. Chassaing, I. Colominas, On the Use of Meshless Methods for the Development of High-Accurate Finite Volume Schemes, ECCOMAS, ADMOS 2011, International Conference on Adaptive Modeling and Simulation, 6-8 June, Paris, France.

[C1] L. Ramirez, X. Nogueira, S. Khelladi, J.C. Chassaing, I. Colominas, NUEVAS FAMILIAS DE MÉTODOS DE ALTO ORDEN DE VOLÚMENES FINITOS OBTENIDAS MEDIANTE LA UTILIZACIÓN E DIFERENTES TÉCNICAS MESHLESS, ongresso CMNE 2011, 4 a 17 de Junho, Coimbra, Portugal, niversidade de Coimbra

[C1] X. Nogueira, S. Khelladi, H. El Hadhen, L. Ramirez, I. Colominas, Métodos de volúmenes finitos con técnicas meshless de aproximación para la resolución de problemas de acústica en turbomáquinas", Congresso CMNE 2011, 4 a 17 de Junho, Coimbra, Portugal, niversidade de Coimbra

[C1] X. Nogueira, S. Khelladi, I. Colominas, F. Bakir, On the use of Moving Least Squares for pressure discretization in low Mach number flows, Numerical Methods for Hyperbolic Equations: Theory an Applications, An international conference to honour Professor E.F. Toro, University of Santiago de Compostela, 4-8 july 2011, Spain

[C1] M. Solis, S. Khelladi, I. Colominas, F. Bakir, "A new-high precision solver to predict pressure fluctuations in centrifugal pumps", in Proceedings of the ASME-JSME-KSME Conference, p. 13, 2011.

[C1] X. Nogueira, S. Khelladi, L. Cueto-Felgueroso, I. Colominas, "Compressible flow applications of a finite volume method based on Moving Least Squares", 6th International Workshop Meshfree Methods for Partial Differential Equations, October 4-6, 2011, Bonn, Germany.

[C1] I. Colominas, J.-C. Chassaing, S. Khelladi, L. Ramirez, X. Nogueira, "Meshless approximations for the development of high order finite volume methods", 6th International Workshop Meshfree Methods for Partial Differential Equations, October 4-6, 2011, Bonn, Germany.

[C1] E. Tannoury, B. Demory, M. henner, S. Khelladi, F. Bakir, "Blade segmentation strategy for tonal noise computation of low Mach axial fans", 14th International Symposium on Transport Phenomena and Dynamics of Rotating Machinery, ISROMAC-14 February 27th - March 2nd, 2012, Honolulu, HI, USA.

[C1] Kim H., Jo Y., Bai I.H., Moon Y. J., Ravelet F., Khelladi S., Bakir F., "3D Computation of Axial-flow Fan Noise by LPCE - Brinkman Penalization Method", FAN2012, International Conference on Fan Noise, Technology and Numerical Methods, 18-20 April 2012 Senlis, France.

[C1] S. Khelladi, X. Nogueira, M. Solis, F. Bakir, I. Colominas and J. Mardjono, "A high-resolution preserving sliding-mesh approach based on meshless methods: application to acoustic propagation in presence of rotor/stator features", Acoustics 2012, Nantes, France, 23 - 27 April 2012, Joint meeting : 11th Congrès Français d'Acoustique and 2012 IOA annual meeting.

[C1] L. Bergerat, S. Khelladi, F. Bakir, "Cavitation Modeling of Thermosensitive Fluids Using Compressible Phases Approach", Proceedings of the 8th International Symposium on Cavitation, CAV2012, August 14-16, 2012, Singapore.

[C1] X. Nogueira, S. Khelladi, J.-C. Chassaing, I. Colominas, "On the computation of low Mach flows using density-based solvers", European Congress on Computational Mechanics ECCOMAS 2012, September 10-14, 2012, Viena, Austria.

► National communications:

[CN1] TCHARKHTCHI A., KHELLADI S., "Mécanique des écoulements lors du rotomoulage, Rotomoulage", ENSAM-Angers, mai 2003.

[CN2] CHINESTA F., PEROT E., KHELLADI S., TCHARKHTCHI A., "Simulation du procédé du rotomoulage", Le Pôle Européen de Plasturgie (PEP) à Bellignat, 17-18 juin 2003

[CN3] TCHARKHTCHI A., KHELLADI S., REY R., "Optimisation des procédés, Rotomoulage, Thermoformage et Soufflage", Tours, 1-2 décembre 2005.

[CN4] ATIM V., KHELLADI S., BAKIR F., YU R., "Moteur à combustion interne : stockage thermique pour la réduction des émission et de la consommation". CFM, Besançon, du 28 août au 02 septembre 2011.

[CN5] ZAARAOUI A., KHELLADI S., "Débitmètre à effet vortex avec capteur à jauge de contraintes et mesure dans une section quadrangulaire". CFM, Besançon, du 28 août au 02 septembre 2011.

Scientific computing codes

- *Code CFDKit* : "*CAA version*" Linearised Euler Solver, "*Euler version*" compressible Euler solver, "*NS version*" compressible Navier-Stokes solver, "*HNS version*" compressible homogeneous model Navier-Stokes solver for cavitating flows, "*SMNS version*" compressible Navier-Stokes sliding-mesh solver.
- *Code PolySPH* : 2D and 3D SPH solver for viscous reactive flows in mobile complex geometries subject thermal constraints and variable viscosity.
- *Code LT-Noise* : Ffowcs-Williams & Hawkings analogy based solver for turbomachines aeroacoustic modelling.
- *Code TurboKit - AX* : Design and analysis code of axial turbomachines.
- *Code TurboKit - AX⁺* : *TurboKit - AX* with optimisation loop.

Scientific collaborations

1. Xesus Nogueira, Ignasi Colominas, José Paris (UDC, Spain),
2. Jean-Camille Chassaing (UPMC, France),
3. Sébastien Martin (Paris 11, France),
4. Young J. Moon (Korea University, Corée de sud),
5. Riadh Ata (EDF, France).
6. Meriem Laleg (INRIA France).

Scientific projects

- PROJET IC-ARTS : DESIGN METHODOLOGY AND PERFORMANCE ANALYSIS OF RADIAL TURBOMACHINERY
 - main supervisor: Sofiane KHELLADI.
 - beginning: January 2012.
 - duration: 18 months
 - project partners: Arts et Métiers ParisTech : DynFluid/LML/ERDT-FISE, CNAM : LGP2ES.
 - budget: 254.5 KEuros
- NATIONAL RESEARCH AGENCY (ANR) PROJECT : DIESEL INNOVATIVE VVA AND ADVANCED AIR SYSTEM FOR DOWNSPEEDING - DIVAS
 - main supervisor: Renault.
 - beginning : September 2010.
 - duration: 24 months
 - project partners: Renault, IFP, INSEERM, VALEO, Arts et Métiers ParisTech.
 - Budget: 2MEuros, 144 KEuros for ENSAM
- PROJET IC-ARTS : ACOUSTIC WAVE PROPAGATION STUDY INTO SUBSONIC TURBOMACHINES
 - main supervisor: Sofiane KHELLADI.
 - beginning: September 2007.

- duration: 24 month
- budget: 95 KEuros

Pedagogic activities

Masters

- *Performance optimization of turbomachinery* : Master of science IMCE, Arts et Métiers ParisTech/UPMC - 20H.
- *Aeroacoustics, noise and environment of machines* : Master of science IMCE, Arts et Métiers ParisTech/UPMC - 4.5H.
- *Advanced Computational Fluid Dynamics Applied to Industrial Cases* : Master of science, University of Santiago de Compostela, Spain - 12H. Since 2007.

Engineer cycle

- CFD for thermohydraulics: 3rd year, UEE Engineering for Nuclear Industries, Arts et Métiers ParisTech - 13.5H.
- Acoustics for Engineers: 3rd year, UEE Fluid Engineering of Rotating Machines, Arts et Métiers ParisTech - 20H.
- Introduction to CFD: 3rd year, UEE Fluid Engineering of Rotating Machines, Arts et Métiers ParisTech - 18H.
- Refrigeration cycles: 2nd year, UEC Air conditioning, Arts et Métiers ParisTech - 12H.
- Thermodynamics and hydrostatics : 1st year, Fontanet training courses, Arts et Métiers ParisTech - 10H.
- Air conditioning: 1st year, FIP training - 18H.
- Heat pumps: 2nd year, FIP training - 18H.
- CAD of turbomachines and CFD : 2nd year, UEC air conditioning and UEC Wind turbines, Arts et Métiers ParisTech - 50H.