

# Nicolas F. Ponchaut

4580 S Valley View Blvd, Suite B-2  
Las Vegas, NV 89103

Telephone: (702) 403-2603  
Email: [nicolas.ponchaut@gmail.com](mailto:nicolas.ponchaut@gmail.com)

---

## *SUMMARY*

- International university background, involving Belgium, USA and Canada
- Extensive experience in experimental, numerical, computational and theoretical work
- Fluent in French, English and Dutch
- Ability to adapt quickly and effectively to new situations or environments

## *EDUCATION*

- California Institute of Technology** Pasadena, CA, USA  
**Graduate Aeronautical Laboratories**
- Ph.D., Aeronautics* Jun 2005  
*Minor in Solid Mechanics*  
Thesis: *Part I: 3DPTV: Advances and Error Analysis*  
*Part II: Extension of Guderley's Solution for Converging Shock Waves*  
Advisor: Dr. H. G. Hornung, Kelly Johnson Professor of Aeronautics
- M.S., Aeronautics* Jun 2001  
GPA: 4.2/4.0
- Université de Liège** Liège, Belgium  
*B.S., Electro Mechanical Engineering* Jun 2000  
Thesis: *Numerical investigation of aero-thermal coupling in turbine blades* (written in French)  
Advisor: Prof. J.-A. Essers

## *EXPERIENCE*

- Kama'aina Productions** Carmel, CA, USA  
*Manager – Software developer* Oct 2006-Current
- Project manager for a new online store
    - ◆ Plan and start a new business
    - ◆ Design highly efficient warehousing operations to lower costs and human errors
    - ◆ Program a fully automated database system, including automatic reorder suggestions, on-demand live performance reports, automatic price updates based on cost and competitor pricing, etc
- McGill University** Montréal, QC, Canada  
*Postdoctoral Scholar* Jul 2005-Sep 2006
- Develop a quasi-1D numerical code to solve the reactive compressible Euler equations in variable geometries
  - Study the scaling of blast waves
- McGill University** Montréal, QC, Canada  
*Teaching Assistant* Jan 2006-Apr 2006
- “Thermodynamics 1”
  - “Fluid Mechanics 2”
  - “Fundamentals of Fluid Mechanics”
    - ◆ Prepare, solve and correct homework and exams
    - ◆ Answer student questions
    - ◆ Give lectures on various course topics

**California Institute of Technology** Pasadena, CA, USA  
**Graduate Aeronautical Laboratories** Jan 2002-Jun 2005  
*Teaching Assistant*

- “Propulsion, Dynamics, and Control of Aircrafts”
- “Non Steady Gas Dynamics”
  - ◆ Prepare solutions and correct homework and exams
  - ◆ Answer students’ questions

**California Institute of Technology** Pasadena, CA, USA  
**Graduate Aeronautical Laboratories** Jan-Jun 2002  
*Laboratory Assistant*

Assist students with experiments that led to journal publications

**California Institute of Technology** Pasadena, CA, USA  
**Graduate Aeronautical Laboratories** Jul 2001-Jun 2005  
*Graduate Research Assistant*

- Perform experimental work in the Ludwig Tube Laboratory
  - ◆ Monitor the performance of the facility (verification and certification)
  - ◆ Set up and maintain the Ludwig Tube Laboratory equipment (optical system, data acquisition software and hardware)
  - ◆ Advance the DDPIV technique by evaluating and improving the accuracy of the system and by adapting the method to subsonic and supersonic air flows
- Conduct theoretical projects on converging shocks:
  - ◆ Study the generation of converging shocks using a gas interface
  - ◆ Improve the Guderley solution for imploding shocks (very useful for the Department of Energy’s *Advance Simulation and Computing* program)
- Present results obtained from experiments and theories in both journal articles and conference proceedings

**Université de Liège** Liège, Belgium  
*Research Assistant* Sep 1999-Jun 2000

- Unify two existing software packages
  - ◆ Professor Esser’s group Computational Fluid Dynamic program
  - ◆ Oofelie (Object Oriented Finite Element Led by Interactive Executor)
- Apply the resulting package to evaluate the temperature distribution in a turbine blade with internal cooling, taking into account the flow around the blade

**Université de Liège** Liège, Belgium  
*Teaching Assistant* Sep 1998-Jun 1999

- “Dynamics of Mechanical Constructions”
- “Applied Thermodynamics”

## **AWARDS AND HONORS**

**California Institute of Technology** Pasadena, CA, USA  
*Rolf D. Buhler Memorial Award in Aeronautics* Jun 2001

**Université de Liège** Liège, Belgium  
*Academic honors* (High and Highest Honors) Jun 1996-Jun 2000  
*Pisard organization fellowship* Oct 1995-Oct 1996

Nicolas Ponchaut

**PUBLICATIONS AND INTERNAL REPORTS**

- Journal of Fluid Mechanics** Jul 2006  
*On Imploding Cylindrical and Spherical Shock Waves in a Perfect Gas*  
N. F. Ponchaut, H. G. Hornung, D. I. Pullin and C. A. Mouton
- GALCIT Internal Report** Aug 2005  
*3D Particle Tracking Velocimetry Method: Advances and Error Analysis*  
N. F. Ponchaut, C. A. Mouton, H. G. Hornung and D. Dabiri

**CONFERENCES AND INVITED TALKS**

- 2006 Combustion Institute/Canadian Section Spring Technical Meeting** Waterloo, ON, Canada  
*Blast Wave from the Explosion of a Reacting Sphere* 14-16 May 2006  
N. F. Ponchaut, F. Zhang and J. H. S. Lee
- 1<sup>st</sup> Int. Mach Reflection Symposium cum Shock-Vortex Interaction Workshop** Jeju, Korea  
*Extension of Guderley Solution for Imploding Shocks* (Abstract accepted) 1-4 Nov 2004  
N. F. Ponchaut, H. G. Hornung
- 42<sup>nd</sup> AIAA Aerospace Sciences Meeting and Exhibit** Reno, NV, USA  
*Development of Three Dimensional Particle Tracking Velocimetry for* 5-8 Jan 2004  
*Supersonic Flow*  
N. F. Ponchaut, C. A. Mouton and H. G. Hornung
- Several invited talks** Japan - Korea  
*Design of a Mach 2.3 Ludwieg Tube* Mar 2003  
N. F. Ponchaut, C. A. Mouton, B. Valiferdowski and H. G. Hornung  
*Implementation of 3D-Particle Triangulation Velocimetry*  
N. F. Ponchaut, C. A. Mouton and H. G. Hornung

**LANGUAGES**

- French: Native language
- English: Fluent
- Dutch: Fluent

**TECHNICAL SKILLS**

- Programming languages: C, C++, MATLAB, LabVIEW, Fortran 77, PHP 5
- Scientific software: Mathematica
- Editing: Microsoft Office, LaTeX

**PERSONAL INTERESTS (EXTRACURRICULAR ACTIVITIES)**

- Languages
- Music (both playing and listening)
- Reading, skiing, travel

**REFERENCES**

Available upon request