

# Curriculum Vitae

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**Dr. Axel Damián DENTE**

dente (at) famaf.unc.edu.ar

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## Present Position:

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**Postdoctoral Position** at “Facultad de Matemática, Astronomía y Física (FaMAF), Universidad Nacional de Córdoba” since April 2007.

Member of: Instituto de Física Enrique Gaviola-CONICET..

## Academic Data:

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**March 2012:** Doctor en Física (equivalent to Dr. in Physics) Universidad Nacional de Córdoba, Argentina.

**March 2007:** Licenciado en Física (equivalent to Master in Physics) Universidad Nacional de Córdoba, Argentina.

GPA: **8.37**(scale 1-10).

**Unfinished:** Fourth year of Licenciatura en Matemática (equivalent to Master in Mathematics) Universidad Nacional de Córdoba, Argentina.

GPA: **7.59**(scale 1-10).

## Fellowships:

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**PostDoctoral Fellowship:** CONICET Postdoctoral (National Council of Science and Technology, Argentina).

**April 2012 to March 2014**

**Doctoral Fellowship:** CONICET tipo II (National Council of Science and Technology, Argentina).

**April 2010 to March 2012**

**Doctoral Fellowship:** CONICET tipo I (National Council of Science and Technology, Argentina).

**April 2007 to March 2010**

## Publications:

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• *The Loschmidt Echo as a robust decoherence quantifier for many-body systems*, Pablo R. Zangara, Axel D. Dente, Patricia R. Levstein and Horacio M. Pastawski, Phys. Rev. A **86**, 012322 (2012).

Web: <http://arxiv.org/abs/1111.2004>

• *Non-Markovian decay and dynamics of decoherence in private and public environments*, Axel D. Dente, Pablo R. Zangara and Horacio M. Pastawski, Phys. Rev. A **84**, 042104 (2011).

Web: <http://pra.aps.org/abstract/PRA/v84/i4/e042104>

• *Boosting quantum evolutions using Trotter-Suzuki algorithms on GPUs*, Carlos S. Bederián and Axel D. Dente, Anales de las 40JAIIO - ISSN 1850-2776 , 63-75 (2011).

Web: <http://www.40jaiio.org.ar/sites/default/files/T2011/HPC/902.pdf>

• *Dynamical regimes of a quantum swap gate beyond the Fermi Golden Rule*, Axel D. Dente, Raúl A. Bustos-Marún, Horacio M. Pastawski, Phys. Rev. A **78**, 062116 (2008).

Web: <http://link.aps.org/doi/10.1103/PhysRevA.78.062116>

## Awards, grants, etc.:

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**Best Poster Prize:** V Latin American Symposium on High Performance Computing HPCLatAm 2012.  
**August 2012**

**Referee of:** V Latin American Symposium on High Performance Computing HPCLatAm 2012.  
**August 2012**

## Organized Conferences:

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- **May, 2011:** *First Argentinean School of GPGPU computing for Scientific Applications*, (Cordoba, Argentina).  
Web: <http://www.famaf.unc.edu.ar/grupos/GPGPU/EscuelaGPGPU2011/>.

## Administrative Activities:

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- Member of the Postgraduate Committee in FaMAF. August-2008 to October-2010

## Seminars:

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- **Title:** “Use of video cards in scientific applications: an application to the quantum dynamic problem”  
Place: *Facultad de Ciencias Exactas, Fsico - Qumicas y Naturales - UNRC*. October, 2012  
Web: <http://www.exa.unrc.edu.ar/page/?actionId=2&info=216662017>
- **Title:** “GPU enhanced spin dynamics with Trotter-Suzuki evolutions”  
Place: *41 JAIIO - Jornadas Argentinas de Informatica - HPC*. August, 2012  
Web: <http://www.41jaiio.org.ar/hpc>
- **Title:** “From games to physics: Numerical simulations with GPUs”  
Place: *VI Encuentro Informal de Materia Condensada*. May, 2012  
Web: <http://www.lanais.famaf.unc.edu.ar/EIMC/index.php?sec=prg-lect>
- **Title:** “Anderson-Newns Model: A theoretical approach to the chemical adsorption and heterogenous catalysis”  
Place: *Facultad de Matemáticas Astronomía y Física, UNC, Argentina*. March, 2012
- **Title:** “Racetrack Memories: From the Magnet physics to the last applications with magnetic domains”

Place: *Facultad de Matemáticas Astronomía y Física, UNC, Argentina*. October, 2011

- **Title: “Boosting quantum evolutions using Trotter-Suzuki algorithms on GPUs.”**

Place: *40 JAIIO - Jornadas Argentinas de Informatica - HPC*. August, 2011

Web: <http://www.40jaiio.org.ar/hpc>

- **Title: “Dynamical Phase Transition in open quantum systems”**

Place: *Instituto de Astronomía y Física del Espacio (IAFE - CONICET - UBA)*. May, 2011

- **Title: “From Games to Science”**

Place: *Condensed Matter Theory Group (GTMC) - FaMAF-UNC*. June, 2010

Web: [www.famaf.unc.edu.ar/gtmc/GPUsDenteFerrero.pdf](http://www.famaf.unc.edu.ar/gtmc/GPUsDenteFerrero.pdf)

## Teaching:

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### Undergraduate Levels:

- **2012-** Second Middle, **Laboratory II (for Chemistry)**, *Assistant Professor A*
- **2012-** First Middle, **Physics IV**, *Assistant Professor A*
- **2011-** Second Middle, **Modern Physics**, *Assistant Professor A*
- **2011-** First Middle, **Numerical Calculus**, *Assistant Professor A*
- **2010-** Second Middle, **Physics II (For Chemistry)**, *Assistant Professor A*
- **2010-** First Middle, **Numerical Calculus**, *Assistant Professor A*
- **2007-** First Middle, **Introduction to Physics**, *teaching assistant*
- **2006-** Second Middle, **Modern Physics**, *teaching assistant*
- **2006-** First Middle, **General Physics IV**, *teaching assistant*

### Others:

- **2012-** All the year, **Coach International Olympic Physics Team**, *Ad Honorem*
- **2012-** 12Hs, **Introduction to Cuda: Scientific Programming in Video Cards**, **La Plata, Argentina**,
- **2010-** All the year, **Coach International Olympic Physics Team**, *Ad Honorem*

### Courses:

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- **“Coherences and Nuclear Magnetic Resonance”**

Teacher: *Patricia R. Levstein*, 60 Hours. (2010)

(Approved 10/10)

- **“High Performance computing: Models, Methods and Means”**

Teacher: *Thomas Sterling, Louisiana State University, EEUU*, 60 Hours. (2010)

- **“Introduction to critical phenomena theory”**

Teacher: *P. Serra*, 60 Hours. (2010)

(Approved 10/10)

- **“Quantum Theory of Solids”**

Teacher: *Horacio M. Pastawski*, 60 Hours. (2009)

(Approved 10/10)

- **“Introduction to Solid State Physics”**

Teacher: *Mariano Zuriaga*, 60 Hours. (2008)

(Approved 8/10)

- **“Molecular Electronic”**

Teacher: *Horacio M. Pastawski*, 60 Hours. (2007)

- **“Multiple Quantum Coherences and advances techniques in Nuclear Magnetic Resonance”**

Teacher: *Patricia R. Levstein*, 60 Hours. (2007)

## Language Proficiency:

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- Spanish (Mother Tongue)
- English (Advanced)
- Portuguese (Initial)

## Assisted Conferences:

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- Scientific meeting: *Argentinean Physical Society meeting*

Type of Meeting: Congress

City: **Cordoba, Argentina**

Date: September, **2012**

Participation as: Participant

**Contribution:** *GPU accelerated spin dynamics with Trotter-Suzuki evolutions.*, Axel D. Dente, Pablo R. Zangara and Horacio M. Pastawski. Poster

**Contribution:** *Reversión temporal en dinámica cuántica por RMN: resultados preliminares en adamantano*, Dente A. D., Buljubasich L., Sanchez C. M., Levstein P. R. and Chattah A. K.. Poster

- Scientific meeting: *41 JAIIO - Jornadas Argentinas de Informatica - HPC*

Type of Meeting: Workshop

City: **La Plata, Argentina**

Date: August, **2012**

Participation as: Speaker

- Scientific meeting: *V Latin American Symposium on High Performance Computing HP-CLatAm 2012, and HPC School (ECAR 2012)*

Type of Meeting: School and Workshop

City: **Buenos Aires, Argentina**

Date: August, **2012**

Participation as: Participant

**Contribution:** *GPU accelerated spin dynamics with Trotter-Suzuki evolutions.*, Axel D. Dente, Pablo R. Zangara and Horacio M. Pastawski. Poster

- Scientific meeting: *XII Encuentro "Superficies y Materiales Nanoestructurados" 2012*

Type of Meeting: Workshop

City: **Cordoba, Argentina**

Date: May, **2012**

Participation as: Participant

- Scientific meeting: *VI Encuentro Informal de Materia Condensada*

Type of Meeting: Workshop

City: **Cordoba, Argentina**

Date: May, **2012**

Participation as: Invited Speaker

- Scientific meeting: *Argentinean Physical Society meeting*

Type of Meeting: Congress

City: **Montevideo, Uruguay**

Date: September, **2011**

Participation as: Participant

**Contribution:** *Observables globales y locales para el Eco de Loschmidt en sistemas de muchos cuerpos*, Zangara P, Dente A, Levstein P, Pastawski H. Poster

- Scientific meeting: *First Argentinean School of GPGPU computing for Scientific Applications*

Type of Meeting: School

City: **Cordoba, Argentina**

Date: May, **2011**

Participation as: Participant and Organizer

- Scientific meeting: *Autumn College on Non-Equilibrium Quantum Systems*

Type of Meeting: School

City: **Buenos Aires, Argentina**

Date: May, **2011**

Participation as: Participant

**Contribution:** *Quantum Synchronization in tight binding systems: Studies on dynamical properties and electronic transport*, Axel D. Dente and Horacio M. Pastawski. Poster

- Scientific meeting: *School and Workshop on New Trends in Quantum Dynamics and Quantum Entanglement*

Type of Meeting: School and Workshop

City: **Trieste, Italy**

Date: February, **2011**

Participation as: Participant

**Contribution:** *Quantum Synchronization in tight binding systems: Studies on dynamical properties and electronic transport*, Axel D. Dente and Horacio M. Pastawski. Poster

- Scientific meeting: *1st São Paulo School of Advanced Science: Spintronics and Quantum Computation*

Type of Meeting: School

City: **São Carlos, São Paulo, Brasil**

Date: September, **2010**

Participation as: Participant

**Contribution:** *Transporte Electronico a través de “sistemas Sincronizados”*, Axel D. Dente and Horacio M. Pastawski. Poster

- Scientific meeting: *Argentinean Physical Society meeting*

Type of Meeting: Congress

City: **Malargüe, Mendoza, Argentina**

Date: September, **2010**

Participation as: Participant

**Contribution:** *Cuantificando la Decoherencia en canales de Espines cuánticos usando el Eco de Loschmidt*, P. R. Zangara, Axel D. Dente, P. R. Levstein and Horacio M. Pastawski. Poster

- Scientific meeting: *First National Meeting on High Performance Computing for scientific applications*

Type of Meeting: Congress

City: **La Falda, Córdoba, Argentina**

Date: March, **2010**  
Participation as: Participant

- Scientific meeting: *CUDA for GPGPU Computing*  
Type of Meeting: Seminar  
City: **Córdoba, Argentina**  
Date: March, **2010**  
Participation as: Participant

- Scientific meeting: *II Quantum Information, Workshop and School - Paraty 2009*  
Type of Meeting: School  
City: **Rio de Janeiro, Brasil**  
Date: September, **2009**  
Participation as: Participant

**Contribution:** *Quantum and Classical Synchronization from Simple non-Hermitian*, Dente Axel D., Raúl Bustos-Marín and Horacio M. Pastawski. Poster

- Scientific meeting: *Eleventh J. J. Giambiagi Winter School: The Quantum Mechanics of the XXI Century: Manipulation of Coherent Atomic Matter*  
Type of Meeting: School  
City: **Buenos Aires, Argentina**  
Date: August, **2009**  
Participation as: Participant

**Contribution:** *Quantum and Classical Synchronization from Simple non-Hermitian*, Dente Axel D., Raúl Bustos-Marín and Horacio M. Pastawski. Poster

- Scientific meeting: *Mini-School on Disordered Systems 2008 and 6th International Workshop on Disordered Systems*  
Type of Meeting: Workshop  
City: **La Falda, Córdoba, Argentina**  
Date: September, **2008**  
Participation as: Participant

**Contribution:** *Memory Effects: Exceptional Points and Virtual States*, Dente Axel D. and Horacio M. Pastawski. Poster

- Scientific meeting: *School on "Physics of Transport in Nanostructures" and Workshop and Workshop on the physics of nanostructures and nanomaterials*  
Type of Meeting: Workshop  
City: **Bariloche, Argentina**  
Date: September, **2007**  
Participation as: Participant

**Contribution:** *Transición de Fase Dinámica Cuántica en Una Compuerta de Intercambio en inter-*



*acción con un Ambiente Cuántico*, Dente Axel D. and Horacio M. Pastawski. Poster

• Scientific meeting: ***Argentinean Physical Society meeting***

Type of Meeting: Congress

City: **Salta, Argentina**

Date: September, **2007**

Participation as: Participant

**Contribution:** *Transición de Fase Dinámica Cuántica en Una Compuerta de Intercambio en interacción con un Ambiente Cuántico*, Dente Axel D. and Horacio M. Pastawski. Poster

• Scientific meeting: ***Ninth J. J. Giambiagi Winter School Part A***

Type of Meeting: School

City: **Buenos Aires, Argentina**

Date: August, **2007**

Participation as: Participant

**Contribution:** *Dynamical Phase Transition in a Swapping Gate interacting with environment*, Dente Axel D. and Horacio M. Pastawski. Poster

• Scientific meeting: ***Argentinean Physical Society meeting***

Type of Meeting: Congress

City: **Merlo, San Luis, Argentina**

Date: September, **2006**

Participation as: Participant

• Scientific meeting: ***Times of Challenge: Taming the Quantum World of Uncertainties***

Type of Meeting: Conference

City: **Córdoba, Argentina**

Date: October, **2005**

Participation as: Participant

• Scientific meeting: ***Argentinean Mathematical Society meeting***

Type of Meeting: Congress

City: **Salta, Argentina**

Date: September, **2005**

Participation as: Participant

• Scientific meeting: ***Argentinean Physical Society meeting***

Type of Meeting: Congress

City: **La Plata, Argentina**

Date: September, **2005**

Participation as: Participant

**Contribution:** *Precipitación de Co en aleaciones de CuCo solidificadas en forma ultrarrápida*, Dente Axel D. , Garcia S. , Fabietti L. M. and Urreta S. E.. Poster

- Scientific meeting: *II Meeting on Differential Geometry*

Type of Meeting: Congress

City: **La Falda, Córdoba, Argentina**

Date: June, **2005**

Participation as: Participant

- Scientific meeting: *II Conference on Differential Equations, Optimization and Numerical Analysis*

Type of Meeting: Congress

City: **Córdoba, Argentina**

Date: March, **2005**

Participation as: Participant

- Scientific meeting: *Argentinean Mathematical Society meeting*

Type of Meeting: Congress

City: **Neuquén, Argentina**

Date: September, **2004**

Participation as: Participant