MIKEL PALMERO

Postdoctoral Research Fellow

Birth date: 24-03-1989 Nationality: Spanish
@ mikel.palmero@ehu.eus 94 601 4781
Ingeniero Torres Quevedo Plaza, 1, 48013 Bilbao, Bizkaia Spain

PROFESSIONAL EXPERIENCE

Assistant Professor

Applied Physics I department, Unversity of the Basque Country

July 2020 – Present Bilbao, Spain

- Teaching: Physics in 1st year engineering courses.
- Independence for research line. Starting a new line to apply "Shortcuts to adiabaticity" to engineering systems.
- Supervising one student for the master thesis.

Postdoctoral Research Fellow

Science and Math Cluster, Singapore University of Technology and Design (SUTD)

September 2017 – December 2019 Singapore

- Topic: Many-Body Open Quantum Systems.
- Goal: Study and manipulate the interactions in large quantum systems under the influence of the environment.
- Skills: Master Equation solving, High Performance Computing (Supercomputer).

Co-President

SUTD PostDoc Society

April 2019 – December 2019 Singapore

- Responsible for all Postdoc Society events.
- Regular meetings with provosts, management, and head of departments.
- Responsible for the fundraising and organization of a yearly academic conference (Research Fest).
- More info: **Postdoc Society webpage**.

Social Event Coordinator

SUTD PostDoc Society

January 2018 – March 2019 Singapore

- Responsible of a monthly social gathering for SUTD Postdoctoral Researchers.
- Collaboration in general purpose committee tasks: Meetings, academic event organization, fundraising...

Postdoctoral Research Fellow

Department of Physical Chemistry, University of the Basque Country

February 2017 – September 2017 Bilbao, Spain

- Tasked to mentor 2 new PhD students in the group.

PhD student in Quantum Science and Technology

Department of Physical Chemistry, University of the Basque Country

February 2013 – January 2017 Bilbao, Spain

LANGUAGES

Spanish (Native)	●●●●●
Basque (Native)	●●●●●
English	●●●●●
German	●●●●○
Chinese (only spoken)	●●○○○

SOFT SKILLS

Analytical thinking · Resiliency · Collaborative · Leadership · Willingness to learn

TECHNICAL SKILLS

Matlab · Python · PBS · Keynote/Power Point · Numerical simulations · LaTeX · C++ · Report writing · Comprehensive Research

RELEVANT COURSES

- Multiple online courses in the MATLAB Academy.
- NSCC given courses on supercomputing job submission and job parallelization.

- Topic: Shortcuts to Adiabaticity in Trapped Ions.
- Goal: Design theoretical protocols to improve the manipulation of trapped ions in processes necessary for quantum computing.
- Skills: Schrödinger Equation solving, optimization problems.

Assistant Teacher in Undergrad Courses

Department of Physical Chemistry, University of the Basque Country

2014 – 2017 Bilbao, Spain

Chemistry lab assistant in undergrad level for over a 100 hours:
- "Experimentation in Chemical Physics" course: Grad in Chemistry.
- "Thermodynamics and Chemical Kinetics" course: Grad in Biology.
- "Chemistry II" course: Grad in Chemistry.

Research Assistant in Quantum Science and Technology

Department of Physical Chemistry, University of the Basque Country

July 2012 – January 2013 Bilbao, Spain

JOURNAL PUBLICATIONS

18) **"Invariant-based inverse engineering of time-dependent, coupled harmonic oscillators"**
A. Tobalina, E. Torrontegui, I. Lizuain, M. Palmero, J. G. Muga
Phys. Rev. A **102**, 063112 (2020).

17) **"Time-dependent harmonic potentials for momentum or position scaling"**
J. G. Muga, S. Martínez-Garaot, M. Pons, M. Palmero, A. Tobalina
Phys. Rev. Research **2**, 043162 (2020).

16) **"Trapped-ion Fock-state preparation by potential deformation"**
M. A. Simón, M. Palmero, S. Martínez-Garaot, J. G. Muga
Phys. Rev. Research **2**, 023372 (2020).

15) **"Towards generation of cat states in trapped ions set-ups via FAQUAD protocols and dynamical decoupling"**
Mikel Palmero, Miguel Ángel Simón, Dario Poletti
Entropy **21(12)**, 1207 (2019).

14) **"Thermalization with detailed-balanced two-site Lindblad dissipators"**
Mikel Palmero, Xiansong Xu, Chu Guo, Dario Poletti
Phys. Rev. E **100**, 022111 (2019).
Figure chosen by PRE for the August Kaleidoscope

13) **"Fast atom transport and launching in a nonrigid trap"**
A. Tobalina, M. Palmero, S. Martínez-Garaot, J. G. Muga
Sci. Rep. **7**, 5753 (2017).

12) **"Dynamical normal modes for time-dependent Hamiltonians in two dimensions"**
I. Lizuain, M. Palmero, J. G. Muga
Phys. Rev. A **95**, 022130 (2017).

11) **"Fast phase gates with trapped ions"**
M. Palmero, S. Martínez-Garaot, D. Leibfried, D. J. Wineland, J. G. Muga
Phys. Rev. A **95**, 022328 (2017).

10) **"Fast driving between arbitrary states of a quantum particle by trap deformation"**
S. Martínez-Garaot, M. Palmero, D. Guéry-Odelin, J. G. Muga
Phys. Rev. A **94**, 063418 (2016).

9) **"Shortcuts to adiabaticity for an ion in a rotating radially-tight trap"**

EDUCATION

Master degree in Quantum Science and Technology

University of the Basque Country

2011 – 2012 Bilbao, Spain

- Master thesis: "Quantum Backflow"

Bachelor degree in Physics

University of the Basque Country

2007 –2011 Bilbao, Spain

- Specialization in "Theoretical Physics"
- Bachelor thesis: 'Review of the Yun Wang Model of the Accelerated Expanding Universe from Current Observational Data"

FELLOWSHIPS AND PRIZES

2019 Extraordinary thesis award for the 2016/17 school year granted by the University of the Basque Country

2012 PhD fellowship for 4 years by the University of the Basque Country

2012 PhD fellowship for 3 years by the University of Cork (declined)

2007 "Matrícula de Honor de Bachiller" (graduated in high school with honors)

M. Palmero, Shuo Wang, D. Guéry-Odelin, Jr-Shin Li, J. G. Muga
New J. Phys. **18** 043014 (2016).
Video abstract highlighted by New Journal of Physics as one of the top 5 of 2016.

8) **"Fast bias inversion of a double well without residual particle excitation"**
S. Martínez-Garaot, M. Palmero, D. Guéry-Odelin, J. G. Muga
Phys. Rev. A **92**, 053406 (2015).

7) **"Fast separation of two trapped ions"**
M. Palmero, S. Martínez-Garaot, U. G. Poschinger, A. Ruschhaupt, J. G. Muga
New J. Phys. **17**, 093031 (2015).

6) **"Fast expansions and compressions of trapped ion-chains"**
M. Palmero, S. Martínez-Garaot, J. Alonso, J. P. Home, J. G. Muga
Phys. Rev. A **91**, 053411 (2015).

5) **"Optimal transport of two ions under slow spring-constant drifts"**
Xiao-Jing Lu, Mikel Palmero, Andreas Ruschhaupt, Xi Chen, Juan Gonzalo Muga
Phys. Scr. **90**, 074038 (2015).

4) **"Fast transport of mixed-species ion chains within a Paul trap"**
M. Palmero, R. Bowler, J. P. Gaebler, D. Leibfried, J. G. Muga
Phys. Rev. A **90**, 053408 (2014).

3) **"Interference of spin-orbit-coupled Bose-Einstein condensates"**
Sh. Mardonov, M. Palmero, M. Modugno, E. Ya. Sherman, J. G. Muga
EPL **106**, 60004 (2014).

2) **"Fast transport of two ions in an anharmonic trap"**
M. Palmero, E. Torrontegui, D. Guéry-Odelin, J. G. Muga
Phys. Rev. A **88**, 053423 (2013).

1) **"Detecting quantum backflow by the density of a Bose-Einstein condensate"**
M. Palmero, E. Torrontegui, J. G. Muga, M. Modugno
Phys. Rev. A **87**, 053618 (2013).

INVITED TALKS AND ORGANIZATION

Invited talks at international conferences (3)

2019 **IPS Meeting 2019**, Singapore

2014 **STA2014**, Shanghai, China
ECTI2014, Mainz, Germany

Invited talks at international institutions (4)

2017 University of New Mexico (videoconference)

2015 NIST Boulder
The Hebrew University in Jerusalem

2014 ETH Zurich

Organization of international conferences (3)

2019 IPS Meeting 2019, Singapore
Research Fest 2019, Singapore

2012 STA2014, Bilbao, Spain

VISITING SCHOLAR

Xi Chen Group
Shanghai University
July 2012 — Shanghai, China
- Host: Xi Chen
- 1 month visit

Xi Chen Group
Shanghai University
June-August 2012 — Shanghai, China
- Host: Xi Chen
- 2 month visit

Jonathan Home Group
ETH Zurich
October 2013 — Zurich, Switzerland
- Host: Joseba Alonso
- 1 week visit
- Invited talk

David Wineland Group
NIST Boulder
May-June 2015 — Boulder, USA
- Host: Dietrich Leibfried
- 2 week visit
- Invited talk

Ronnie Kosloff Group
The Hebrew University
November 2015 — Jerusalem, Israel
- Host: Erik Torrontegui
- 1 week visit
- Invited talk

TEACHING

2020/21 School year

Bilbao, Spain

- Physics I and II
  - Grad in “Marine Engineering” and “Navigation and Transportation”
  - 90 hours, lead teaching lectures and exercise class
- Fundamentals of Physics for Engineers
  - Grad in “Electrical Engineering”, “Industrial-Electrical Engineering” and “Mechanical Engineering”
  - 120 hours, lead teaching lectures, group exercise class and lab class

2016/17 School year

Bilbao, Spain

- Experimentation in Chemical Physics
  - Grad in “Chemistry”
  - 16 hours lab assistant

2015/16 School year

Bilbao, Spain

- Chemistry II
  - Grad in “Physics” and “Geology”
  - 24 hours lab assistant
- Experimentation in Chemical Physics
  - Grad in “Chemistry’
  - 36 hours lab assistant

2014/15 School year

Bilbao, Spain

- Thermodynamics and Chemical Kinetics
  - Grad in “Biology”
  - 20 hours lab assistant
- Experimentation in Chemical Physics
  - Grad in “Chemistry”
  - 18 hours lab assistant