Atahualpa S. Kraemer

Talstr. 14, Oberasbach, Germany, ata.kraemer@gmail.com • +49 (1) 6354-65039 •

Born date: Oct/03/1984 (31 years), Texcoco, Mexico.

Nationalities: Mexican, German and Ecuadorian

RESEARCH AREAS: Statistical physics, complex systems, bio-mathematics, computational physics, non-linear dynamics, soft matter.

EDUCATION

Universidad Nacional Autónoma de México, Mexico city, Mexico

Phd (Physics) Feb 2007 – Mar 2014

- Thesis: Periodizing quasicrystals: dynamics in a quasiperiodic Lorentz gas
- Supervisor: Professor David P. Sanders
- The program include the master degree obtained when the project of the research is presented (in the second year of the program).

Universidad Nacional Autónoma de México, Mexico city, Mexico

Bachelor in physics Nov 2002 – May 2007

- Thesis: Phase transitions and jamming effects in simple fluids
- Tutor: Professor Gerardo García Naumos

Universidad Autónoma de Chapingo, Texcoco, México

Aug 1999 – Aug 2002

- Technical agricultural high-school.

RESEARCH EXPERIENCE

Faculty of Mathematics and Economy, University of Pekin, China

Visiting Professor Apr 2014 – May 2014

- I was invited to give a course about quasicrystals to master and Phd students during one month.

Institute for Theoretical Physics II, Heinrich-Heine university of Düsseldorf, Germany

Posdoctoral Researcher Jul 2014 – Dec 2015

- I developed algorithms to study efficiently Lorentz gases in different geometries, including quasiperiodic structures, periodic arrays in the Boltzmann-Grad limit, and random arrays. We obtained analytic approximations for the length of free flights of particles in periodic and quasiperiodic Lorentz gases. This work resulted in two published papers, including one in Physical Review Letters.
- I also contributed to a statistical and mathematical analysis of research about the distribution of arthropods in Mexican amber and in a current forest. The results were published in a paper in PLOS One.

Institute for Theoretical Physics I, Friedrich-Alexander university of Erlangen-Nuremberg, Germany

Postdoctoral Researcher Jan 2016 – to present

- Until July 2016, I have a contract as a postdoctoral researcher at the Friedrich-Alexander University of Erlangen-Nuremberg, Germany. I am preparing a paper about the properties of photonic quasicrystals via a quasiperiodic Lorentz gas, obtaining the photonic bands with good agreement with experimental results found in the literature. I am also investigating jamming of spheres close to the boundaries, using Brownian dynamics simulations. I am collaborating on research about magneto-transport of tracer particles through two-dimensional porous media. In this project we use molecular dynamics simulations to study particles in a random configuration under the action of a strong magnetic field.

PUBLICATIONS

MONOGRAPHS

1) Atahualpa S. Kraemer (2014) "Periodizanodo los cuasicristales: dinámica en un gas de Lorentz cuasiperiódico" thesis UNAM. 131Pp
2) Ricardo Atahualpa Solórzano Kraemer. (2008) "Transiciones de Fase y efectos de atascamiento en fluidos simples" Thesis UNAM. 73pp

PYTHO PEER-REVIEWED PAPERS

3) Atahualpa S. Kraemer Nikolay Kryukov, and David P. Sanders "Efficient algorithms for general periodic Lorentz gases in two and three dimensions", J. Phys. A (2015) 49 (2), 025001
4) Atahualpa S. Kraemer Miechael Schmiedeberg and David P. Sanders "Horizons and free path distributions in quasiperiodic Lorentz gases", Phys. Rev. E (2015) 92 (5), 052131
5) Mónica M Solórzano Kraemer, Atahualpa S. Kraemer Frauke Stebner, Daniel J Bickel, Jes Rust "Entrapment Bias of Arthropods in Miocene Amber Revealed by Trapping Experiments in a Tropical Forest in Chiapas, Mexico", PloS one (2015) 10 (3), e0118820 (3 citas)
6) Atahualpa S. Kraemer David P. Sanders "Zero density of open paths in the Lorentz mirror model for arbitrary mirror probability" J. Stat. Phys. (2014) 156 (5), 908-916
7) Atahualpa S. Kraemer and David P. Sanders "Embedding quasicrystals in a periodic cell: Dynamics in quasiperiodic structures". Phys. Rev. Lett. (2013) 111. 125501. (9 citas)
8) Atahualpa S. Kraemer and Gerardo G. Naumis. "Use of the cage formation probability for obtaining approximate phase diagrams". J. Chem. Phys. (2008) 128. 134516 (11 citas)
9) Atahualpa S. Kraemer Michael Schmiedeberg "Photonic Bands of Colloidal Quasicrystals" (in preparation)
10) Nima H. Siboni, Atahualpa S. Kraemer Jürgen Horbach "Magneto-transport of tracer particles through two-dimensional porous media" (in preparation)

CONFERENCES

CONFERENCES WITH SELECTION COMMITTEE

1) Atahualpa S. Kraemer, Michael Schmiedeberg and David P. Sanders, poster: "Horizons and free path distributions in quasiperiodic Lorentz gases" (2016), Conference of the Middle European Cooperation in Statistical Physics (MECO) , Vienna, Austria.

2) Atahualpa S. Kraemer, Michael Schmiedeberg and David P. Sanders, talk: "Anomalous motion and free flight length distribution in quasiperiodic Lorentz gases" (2015), Aperiodic 2015, Prague, Czech Republic.

3) Atahualpa S. Kraemer and Michael Schmiedeberg, poster: "Photonic bands of colloidal quasicrystals" (2015), 79th Annual Meeting of the DPG and DPG Spring Meeting, Berlin, Germany.

4) Atahualpa S. Kraemer and David P. Sanders, poster: "Using Lorentz gas model to obtain photonic bands in quasiperiodic systems", XLIV Winter Meeting on Statistical Physics, (2015) Mexico City, Mexico.

5) Atahualpa S. Kraemer and David P. Sanders, poster: "Embedding quasicrystals in a periodic cell: Dynamics in quasiperiodic structures", XLIII Winter Meeting on Statistical Physics, (2014) Taxco, Mexico.

6) Atahualpa S. Kraemer and David P. Sanders, poster: "Diffusion in a Quasiperiodic Lorentz gas", Let's Face Chaos through Nonlinear Dynamics of the 8th International Summer School/Conference, (2011) Maribor, Slovenia.

7) Atahualpa S. Kraemer and David P. Sanders, poster: "Diffusion in a Quasiperiodic Lorentz gas", XL Winter Meeting on Statistical Physics, (2011) Taxco, Mexico.

8) Atahualpa S. Kraemer and Heinrich Terborg del Rosal, poster: "Fractality in Plants?", III National Meeting of Biology and Mathematics (2006), Xalapa, Mexico.

9) Pablo Linares Linares , Atahualpa S. Kraemer and Ana Bertha Ponce Pachecho, poster: "Programa : Astronomía a nuestro alcance", XLIII National Physics Congress, (2000) Puebla, Mexico.

TALKS BY INVITATION

10) Embedding Quasicrystals in a periodic Cell, University of Pekin, China Apr 2014

11) Simulations in quasiperiodic Lorentz gases, Heinrich-Heine university of Düsseldorf, Germany Jul 2013

12) Periodizing Quasicrystals: dinamics in a quasiperiodic Lorentz gas, University of Bristol, England Jul 2012

13) Gases de Lorentz cuasiperiódicos, Universidad Autónoma de Pachuca, Hidalgo Mar 2012

FELLOWSHIPS AND PRIZES

First place at the XVI Metropolitan Math Olympiad in Mexico City. 2002
I didn't attend the national or international Olympiad since I began my undergraduate degree in physics, and the rules prohibit continuing with the competition in this situation.

Fellowship to attend the VI school on energy at Temixco, Mexico. 2006

Fellowship to attend the national school and conference on bio-mathematics, Xalapa, Mexico. 2006

Fellowship DEGAPA 2006
Grant obtained by working as a research assistant to study jamming and phase transitions. In 2007 we published an article with the results of this research.

Scholarship CONACYT 2007 – 2012
Universidad Nacional Autónoma de México
The grant was used to develop the research during my PhD.

Fellowship DEGAPA 2008
The fellowship was used to attend the annual meeting of the NASA project Cosmic Ray Energetics And Mass (CREAM), at the Maryland University.

Fellowship DEGAPA 2009
Grant obtained by working as a research assistant in the project "Nonlinear dynamics in classical and quantum billiards"

Fellowship DEGAPA-CONACYT 2010-2012
The fellowships were gave to attend to two international conferences and to give a talk at Bristol university. The conferences were: "Winter meeting of statistical physics" 2010, Taxco, Mexico, and "Let's Face Chaos through Nonlinear Dynamics" 2011, Maribor, Slovenia.

Grant ULB 2012
Grant obtained to attend a research stay at Brussels, Belgium.

Prize to the best poster 2014
Prize to the best poster during the winter meeting of statistical physics, 2014.

Postdoctoral Fellowship DEGAPA 2014
6 months of a postdoctoral Fellowship in Mexico City. During this time we published a mathematical article about diffusion.

AFFILIATIONS

German Physical Society,Germany
active member 2015 to present

OTHER JOBS

ASTS, France
Animateur Scientifique Jul 2006 – Aug 2006
- The work involves giving popular science talks on various topics in different resorts.

LFM Mexico city, Mexico
Teacher of physics at the high-school: Lycée Franco-Mexicain. Jul 2009 – Oct 2009

UNAM Mexico city, Mexico
Professor assistant. Aug 2006 – Jul 2011
- Thermodynamics, 2006
- Electromagnetism, 2007
- Collective phenomena (Thermodynamics, waves and fluids), 2009
- Computational physics, 2011

LANGUAGES

Spanish: Mother language.
English: C1.
French: C2.
German: B1.

SKILLS

COMPUTER LANGUAGES

Julia, Python, Fortran, C++, MATLAB, Mathematica, Latex,

SOFTWARE

LaTeX, Ilustrator, Tracker, Photoshop, Open Office (Writer, cal), Gnuplot, Pyplot, Gadfly, Kile

[*CV compiled 2016-12-15*]