



Spokane, Washington, USA, 18th December 2022

CURRICULUM VITAE

Andrés Aragonese Aguado

Personal information

Name: Andrés Aragonese Aguado

Address: Eastern Washington University

Dept. of Physics
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Assistant Professor at Eastern Washington University (WA)
Member of the Spanish Royal Society of Physics (Spain)
Member of the Catalan Society of Physics (Spain)
Member of the Catalan Association of Science Communication (Spain) Member of that
Astronomical Association of Terrassa (Spain) President of the Association Planeta da Vinci
(Spain)

EDUCATION

Postdoctoral researcher, Quantum Key Distribution, Duke University, Durham, North Carolina, 2014-2016.

Postdoctoral researcher, Non-linear Dynamics in laser systems, Polytechnic University of Catalonia, Spain, 2014.

Ph.D., excellent cum laude, Experimental study of feedback-induced dynamics in semiconductor lasers: from symbolic analysis to subwavelength position sensing, Polytechnic University of Catalonia, Spain, 2010-2014. Advisors: Cristina Masoller & Maria Carme Torrent.

M.A., *Complex dynamics in semiconductor lasers with external optical feedback*, Polytechnic University of Catalonia, Spain, **2013**.

M.A. Dispersive mobility in polyimide by surface voltage decay measurements. Polytechnic University of Catalonia, Spain, **2008**.

Positive Report from the agency AQU (Academic Agency for University in Catalonia) as Assistant Professor, **2007**.

B.A., Physics. Autonomous University of Barcelona, Spain, 1989-1994.

PROFESSIONAL EXPERIENCE

09/2018 - today. Assistant Professor, Department of Physics, Eastern Washington University.

09/2016 - 09/2018. Visiting Assistant Professor, Department of Physics and Astronomy, Carleton College.

POSTDOCTORAL APPOINTMENTS

12/2014 - 08/2016. Postdoctoral Associate, Department of Physics, Duke University, NC.

07/2014 - 11/2014. Postdoctoral Associate, Department of Physics and Nuclear Engineering, Universitat Politècnica de Catalunya, Spain.

TEACHING APPOINTMENTS

- 09/2018 - today. Assistant Professor, Department of Physics, Eastern Washington University.
- 9/2016 - 09/2018. Visiting Assistant Professor, Department of Physics and Astronomy, Carleton College.
- 2015-2016 - Instructor of Physics at Duke University.
- 09/2010 - 06/2014 - Teaching Associate, Department Engineering, Universitat Politècnica de Catalunya, Spain.
- 02/2004 - 08/2010 - Teaching Assistant, Department of Physics and Nuclear Engineering, Universitat Politècnica de Catalunya, Spain.
- 9/2010 - 06/2014 - Teaching Assistant, Department of Physics and Nuclear Engineering, Universitat Politècnica de Catalunya, Spain.
- 09/2006 - 08/2010 - Access to University Mathematics Teacher at Escola La Llar, Terrassa, Spain.
- 09/1998 - 10/2005 - Science & Mathematics Teacher at Regina Carmeli High- School, Rubi, Spain.
- 09/1996 - 08/1997 - Teaching Assistant, Department of Physics, Universitat Autònoma de Barcelona, Spain.
- 1996-1997 Assistant Professor at UAB (Universitat Autònoma de Barcelona), Barcelona, Spain, teaching Physics and Dynamical Systems to undergraduate student of Physics, Chemistry and Biology.
- Co-authored several text books of Mathematics and Physics for high school level at editorial Casals (Barcelona, Spain).

RESEARCH

RESEARCH INTERESTS

Complex dynamics, Semiconductor Lasers, Delay systems, Time Series Analysis, Chaos, Optical Neurons, Learning Methodologies.

RESEARCH EXPERIENCE

2018 - today: Complex Dynamical Systems. At Eastern Washington University. 2016 - 2018: Complex Dynamical Systems. At Carleton College.

2014 – 2016: Quantum key distribution at the Quantum Electronics Group of Professor Daniel J. Gauthier, at Duke University.

2010 – 2014: Nonlinear dynamics in semiconductor lasers. At DONLL group (Polytechnic University of Catalonia), Terrassa, Spain (www.donll.upc.edu).

2012: three months stay at Duke University, NC (USA), at the laboratory of Professor Daniel J. Gauthier.

2004 – 2010: Dielectric properties of polymers. At DILAB group (Polytechnic University of Catalonia), Terrassa, Spain.

1994 – 1998: Cosmological models. At Group of Condensed Matter (Autonomous University of Barcelona), Bellaterra, Spain.

PUBLICATIONS

* Indicates paper with undergraduate student.

All papers can be found at: <http://andresaragoneses.weebly.com/publications.html>

- * "TARDYS quantifiers: Extracting Temporal and Reversible Dynamical Symmetries", DNhay Nguyen, Arjendu Pattanayak, and Andrés Aragonese. *Photonics*, **9**, 938 (2022). <https://www.mdpi.com/2304-6732/9/12/938>
- * "Exploiting the impact of ordering patterns in the Fisher-Shannon complexity plane, David Spichak and Andrés Aragonese. *Chaos, Solitons, and Fractals*, **154**, 111620 (2022) doi.org/10.1016/j.chaos.2020.110492.
- * "Ordinal Patterns in the Duffing Oscillator: Analyzing Powers of Characterization", Ian Gunther, Arjendu Pattanayak, and Andrés Aragonese. *Chaos*, **31**, 023104 (2021)
- * "Characterizing complexity of non-invertible chaotic maps in the Shannon-Fisher information plane with ordinal patterns", David Spichak, Audrey Kupetsky, and Andrés Aragonese. *Chaos, Solitons, and Fractals*, 110492 (2021), doi.org/10.1016/j.chaos.2020.110492.
- "Developing educational YouTube videos as a tool to learn and teach physics", Andrés Aragonese and Rebecca Messer, **58**, 7, 488, *The Physics Teacher* (2020). <https://bit.ly/3BJU3jB>
- * "Correlations preceding high-intensity events in the chaotic dynamics of a Raman fiber laser", Andrés Aragonese and Yingqi Ding, *Entropy*, **21**, 2, 151 (2019). <https://www.mdpi.com/1099-4300/21/2/151>
- "A 3D printed wheel with constant mass and variable moment of inertia for lab and demonstration", Eric Hazlett and Andrés Aragonese, **56**, 535, *The Physics Teacher* (2018).
- • "Bounding the outcome of a two-photon interference measurement using weak coherent states", Andrés Aragonese et al., *Optics Letters*, **43**, 16 (2018)

- * "Forecasting Events in the Complex Dynamics of a Semiconductor Laser with Optical Feedback", Meritxell Colet*, and Andrés Aragonese, *Scientific Reports*, **8**, 10741, (2018).
- * "Characterizing Complex Dynamics in the Classical and Semi-Classical Duffing Oscillator Using Ordinal Patterns Analysis", Max L. Trostel*, Moses Z. R. Misplon*, Andrés Aragonese, and Arjendu K. Pattanayak, *Entropy*, **20**, 40 (2018).
- "Disclosure day on relativity: A science activity beyond the classroom", Andrés Aragonese, Nuria Salán, and Antonio Hernández-Fernández, *World Journal of Educational Technology*, **9**, 2, 59-66 (2017)
- "Robust and stable delay interferometers with application to d-dimensional time-frequency quantum key distribution", Nurul T. Islam, Clinton Cahall, Andrés Aragonese, A. Lezama, Jungsang Kim, and Daniel J. Gauthier. Accepted for publication at *Phys. Rev. Appl.* (2017).
- "Unveiling temporal correlations characteristic to phase transition in the intensity of a fibre laser radiation", Andres Aragonese, Laura Carpi, Nikita Tarasov, Dmitry V. Churkin, M. C. Torrent, Cristina Masoller, Sergei K. Turitsyn. *Phys. Rev. Lett.*, **116**, 033902 (2016).
- "Effects of periodic forcing on the temporally correlated spikes of a semiconductor laser with feedback", Taciano Sorrentino, C. Quintero-Quiroz, Andrés Aragonese, M. C. Torrent, and Cristina Masoller, *Optics Express*, Vol. **23** Issue 5, pp.5571 (2015).
- "Unveiling the complex organization of recurrent patterns in spiking dynamical systems", Andrés Aragonese, Sandro Perrone, Taciano Sorrentino, M. C. Torrent, Cristina Masoller, *Nature Scientific Reports*, **4**, 4696 (2014).
- "Experimental and numerical study of the symbolic dynamics of a modulated external-cavity semiconductor laser", Andrés Aragonese, Taciano Sorrentino, Sandro Perrone, Daniel J. Gauthier, M. C. Torrent, Cristina Masoller, *Optics Express*, Vol. **22** Issue 4, pp.4705-4713 (2014).
- "Experimental study of the complex dynamics of semiconductor lasers with feedback via symbolic time-series analysis", Taciano Sorrentino, Andrés Aragonese, Sandro Perrone, Daniel J. Gauthier, M. C. Torrent, Cristina Masoller, *Proceedings of SPIE Photonics Europe, Semiconductor Laser and Laser Dynamics VI*, 91340L, (May 2, 2014). (doi:10.1117/12.2052322)
- "Multidimensional subwavelength position sensing using a semiconductor laser with optical feedback", Seth D. Cohen, Andrés Aragonese, Damien Rontani, M. C. Torrent, Cristina Masoller, Daniel J. Gauthier, *Optics Letters*, Vol. **38** Issue 21, pp. 4331-4334 (2013)
- "Distinguishing signatures of determinism and stochasticity in spiking complex systems", Andrés Aragonese, Nicolas Rubido, Jordi Tiana-Alsina, M. C. Torrent, Cristina Masoller, *Nature Scientific Reports*, **3**, 1778 (2013).
- "Effect of humidity in charge formation and transport in LDPE", A. Aragonese, I. Tamayo, A. Lebrato, J. C. Cañadas, J. A. Diego, D. Arencón and J. Belana. *Journal of electrostatics*, vol. **71**, Issue 4, 611-617 (2013).
"Teaching engineering with autonomous learning tools: good practices in GRAPAU-RIMA". *Procedia Social and Behavioral Sciences*, 46, pp.639-634 (2012).
- "Research activities of the Group on Nonlinear Dynamics, Nonlinear Optics and Lasers (DONLL) at the Universitat Politècnica de Catalunya (Campus de Terrassa)", Jordi Tiana, Jordi Zamora, Cristian Nistor, Vito Roppo, Lina Maigyte, Andrés Aragonese, Nikhil P. Khumar, Cristina Martínez, Juan José Fernández, Carles Serrat, Josep Lluís

Font, Ramon Herrero, Crina Cojocaru, Jose F. Trull, Cristina Masoller, Kestutis Staliunas, M. Carme Torrent, Jordi García-Ojalvo, Ramon Vilaseca. *Opt. Pura Apli.* **44** (2), 219-225 (2011).

- “Study of dispersive mobility in polyimide by surface voltage decay measurements”, A. Aragonese, M. Mudarra, J. Belana, J. A. Diego, *Polymer*, **40**, 2440-2443 (2008).
- “TSDC study of the glass transition: correlation with calorimetric data”, J. A. Diego, J. Sellarès, A. Aragonese, M. Mudarra, J. C. Cañadas, J. Belana, *Journal of Physics D: Applied Physics*, **40**, 4, 1138-1145 (2007).
- “The growth of cosmological perturbations in the transition eras”, A. Aragonese, D. Pavón, W. Zimdahl, *General relativity and gravitation*, **30**, 2, 299-310 (1998).

CONFERENCE CONTRIBUTIONS

INVITED TALKS

“Forecasting events and transitions using ordinal patterns”, Meritxell Comet, Yingqi Ding, Nhat Nguyen, and Andrés Aragonese, Dynamics Days Europe, 22-26 August 2022. (22-08-2022).

“Effects of modulation in the complex dynamics of a semiconductor laser with feedback”, Andrés Aragonese, Taciano Sorrentino, Carlos A. Quintero, M. C. Torrent, Cristina Masoller, (SPIE 2016). Belgium, 4-7 April 2016.

“Characterizing the complex dynamics of a semiconductor laser with optical feedback and modulation”, Andrés Aragonese, Sandro Perrone, Taciano Sorrentino, Daniel J. Gauthier, M. C. Torrent, Cristina Masoller, International Commission for Optics, (ICO 2014). Santiago de Compostela, Spain, 25-29 August 2014. (26-08-2014).

CONTRIBUTED TALKS

“Correlation entropy: Quantifying non-equilibrium ensemble dynamics”, Andrés Aragonese, Arie Kapulkin, and Arjendu Pattanayak, Dynamics Days Europe, 22-26 August 2022. (2-08-2022).

“The Shannon-Fisher complexity plane using ordinal patterns”, David Spichak and Andrés Aragonese, Dynamics Days Europe, 22-26 August 2022. (23-08-2022).

“Using YouTube Videos to Learn and Teach Physics”, Andrés Aragonese at Inland Northwest conference of the American Association of Physics Teachers, online, April 2021.

“Developing Educational YouTube Videos as a Tool to Learn and Teach Physics”, Andrés Aragonese at Partners in Campus and Community Engagement conference, Whitworth University, May 2021,

“Investigating optical complexity of the phase transition in the intensity of a fibre laser radiation”, Aragonese, Andrés; Carpi, Laura; Tarasov, Nikita; Churkin, Dmitry V.; Torrent, M.C.; Masoller, Cristina; Turitsyn, Sergei K (SPIE 2016). Belgium 4-7 April 2016.

“Characterizing the complex dynamics of a semiconductor laser with optical feedback and modulation”, Andrés Aragonese, Sandro Perrone, Taciano Sorrentino, Daniel J. Gauthier, M. C. Torrent, Cristina Masoller, Congreso de Física Estadística, (FISES 2014). Ourense, Spain, 2-4 April 2014. (04-04-14).

“Characterizing the Symbolic Dynamics Underlying the Intensity Dropouts of A Semiconductor Laser with Optical Feedback in the Regime of Low Frequency Fluctuations”, Andrés Aragonese, Sandro Perrone, Taciano Sorrentino, M. C. Torrent, Cristina Masoller, International Symposium on Physics and Applications of Laser Dynamics, Paris, France, 29-31 October, 2013 (30-10-2013).

“Distinguishing signatures of determinism and stochasticity in spiking complex Systems”, Andrés Aragonese, Sandro Perrone, Taciano Sorrentino, M. C. Torrent, Cristina Masoller, Biental de Física, Valencia, Spain, 15-19 June, 2013 (17-07-2013).

“Transitions of determinism and stochasticity in time-delayed complex systems with modulation”, Andrés Aragonese, Sandro Perrone, Taciano Sorrentino, M. C. Torrent, Cristina Masoller. Dynamics Days Europe, Madrid, Spain, 3-7 June 2013 (06-06-2013).

“Nonlinear time-series analysis of low-frequency fluctuations in semiconductor lasers with optical feedback”. International Symposium on Nonlinear Theory and its Applications (NOLTA 2012). Palma de Mallorca, Spain, 22-26 October 2012 (25-10-2012).

“Nonlinear time-series analysis of low-frequency fluctuations in semiconductor lasers with optical feedback”. European Optical Society Annual Meeting (EOSAM 2012). Aberdeen, Scotland, 25-28 September 2012.

POSTERS IN INTERNATIONAL CONFERENCES

Poster: “Temporal escapes in the complex dynamics of a Duffing oscillator”, Ivan Gunther, Lawrence Lin, Andrés Aragonese, and Arjendu Pattanayak, Dynamics Days, Hartford, Connecticut January (2020).

Poster: “Forecasting extreme events in the complex dynamics of diode laser with feedback”, Andrés Aragonese, and Meritxell Colet, Dynamics Days, Evanston, Illinois January (2019).

Poster: “Forecasting extreme events in the complex dynamics of diode laser with feedback”, Meritxell Colet, and Andrés Aragonese, Dynamics Days, Boulder, Colorado January (2018).

Poster: “Discrete-variable time-frequency quantum key distribution”, Nurul T. Islam,

Clinton Cahall, Andrés Aragonese, Charles Ci Wen Lim, J. Kim, Daniel J. Gauthier, SPIE, San Jose, California, USA, 5-10 June (2016)

Poster: “Temporal correlations in the laminar to turbulent transition in a fiber laser”, Andrés Aragonese, Laura Carpi, Nikita Tarasov, Dmitry V. Churkin, M. C. Torrent, Cristina Masoller, and Sergei K. Turitsyn. Dynamics Days USA, Durham, NC, USA, 7-10 January 2016.

Poster: “Characterizing the spiking activity of semiconductor lasers with current modulation and optical feedback via ordinal time-series analysis”. T. Sorrentino, A. Aragonese, N. Rubido, M. C. Torrent, D. J. Gauthier, C. Masoller. International Conference on Delayed Complex Systems. Palma de Mallorca, Spain, 4-8 June 2012.

Poster: “Symbolic statistical ordinal analysis distinguishes determinism from stochasticity in the spiking activity of semiconductor lasers with optical feedback”. A. Aragonese, N. Rubido, T. Sorrentino, M. C. Torrent, C. Masoller. XXXV Brazilian Meeting on Condensed Matter Physics. Aguas de Lindoia, Brazil, 17 May de 2012.

Poster: "Characterizing the spiking activity of semiconductor lasers with current modulation and optical feedback via ordinal time-series analysis". T. Sorrentino, A. Aragonese, N. Rubido, M. C. Torrent, D. J. Gauthier, C. Masoller. XXXV Brazilian Meeting on Condensed Matter Physics. Aguas de Lindoia, Brazil, 17 May de 2012.

Poster: "Distinguishing determinism from stochasticity: ordinal analysis of the structure of the spiking activity of semiconductor lasers with optical feedback". A. Aragonese, N. Rubido, T. Sorrentino, M. C. Torrent, C. Masoller. Deutsche Physikalische Gesellschaft. Berlin, Germany, 25-30 March 2012.

Poster: "Study of packed-like space charge formation in LDPE sheets under DC electric field", A. Lebrato, J. A. Diego, J. C. Cañadas, A. Aragonese, 11th International Conference on Electrostatics, Valencia, Spain-2009

Poster: "Dispersive mobility in polyimide by surface voltage decay measurements", A. Aragonese, M. Mudarra, J. Belana, J. A. Diego, 9th Internacional Conference on Solid Dielectrics Winchester (UK), 2007.

Poster: "a relaxation modelization in PET by TSDC and DSC", J. A. Diego, J. Sellarès, J. Belana, J. C. Cañadas, M. Mudarra, A. Aragonese, J. Orrit, 6th International conference on electric charges in non-conductive materials, Tours (France), 2006.

Poster: "Exact solutions and growth of cosmological perturbations in the transition era from radiation to matter dominance", en "Recent Developments in Theoretical and Experimental General Relativity, Gravitation, and Relativistic Field Theories" Universidad Hebrea de Jerusalén, 22-27 June, editado por Tsvi Piran y Remo Ruffini, World Scientific Publishers, p1318, 1997.

Poster: "Evolution of cosmological perturbations in the transition eras", A. Aragonese, D. Pavón, W. Zimdahl, en "Current topics in mathematical cosmology", editado por M. Ranier y H-J Smidt, p.395, 1998.

POSTERS IN NATIONAL CONFERENCES

Poster "Securing time-bin states by mixing with a weak local oscillator", Andrés Aragonese, Michael G. Eggleston, Nurul Islam, Arturo Lezama, Daniel Gauthier, QKD summer workshop, Waterloo, Canada, 17-21 August 2015.

Poster: "High-dimensional time-frequency quantum key distribution", Nurul Islam, Michael Eggleston, Clinton Cahall, Andrés Aragonese, Bill Brown, Daniel Gauthier, FIP 2015 Symposium, Durham, North Carolina, USA, 9-10 March 2015.

Poster: "Unveiling the complex organization of recurrent patterns in spiking dynamical systems", Andrés Aragonese, Sandro Perrone, Taciano Sorrentino, M. C. Torrent, Cristina Masoller, Complexitat. Barcelona, Spain, 19 June 2014.

Poster: "Unveiling the complex organization of recurrent patterns in spiking dynamical systems", Andrés Aragonese, Sandro Perrone, Taciano Sorrentino, M. C. Torrent, Cristina Masoller, Congreso de Física Estadística, (FISES 2014). Ourense, Spain, 2-4 April 2014. (03-04-14).

Poster: "Ordinal time-series analysis of low-frequency fluctuations in semiconductor lasers with optical feedback". Andrés Aragonese Aguado, Nicolás Rubido, Taciano sorrentino, Maria

Carme Torrent, Cristina Masoller. Congreso de Física Estadística (FISES 2012). Palma de Mallorca, Spain, 18-20 October 2012. (18-10-12).

Poster (05-06-2012): “Ordinal analysis of the spiking activity of semiconductor lasers with time-delayed optical feedback”. A. Aragoneses, N. Rubido, T. Sorrentino, M. C. Torrent, C. Masoller. NOLINEAL. Zaragoza, Spain, 4-6 June 2012.

Working group (21-03-2012): “Delay and coupling” y “Brain networks”. IBERSINC (Red de dinámica y sincronización de redes). Zaragoza, Spain, 20-21 March 2012

Poster: “Laboratorio de dinámica de láseres”, Cristina Masoller, M. C. Torrent, J. García-Ojalvo, Cristian Bonatto, Jordi Tiana-Alsina, Jordi Zamora-Munt, Andrés Aragoneses, Nicolas Rubido, FISES-2011, Barcelona, Spain, 2-4 de June, 2011.

Poster: “Laboratorio de dinámica de láseres”, Cristina Masoller, M. C. Torrent, J. García-Ojalvo, Cristian Bonatto, Jordi Tiana-Alsina, Jordi Zamora-Munt, Andrés Aragoneses, Nicolas Rubido, IBERSINC-2011, Barcelona,, Spain 17-18 de March, 2011.

Poster: “Experimental study of different LFF regimes in semiconductor lasers with an external cavity”, A. Aragoneses, J. Zamora-Munt, J. Tiana-Alsina, M. C. Torrent, C. Masoller, Quantum Optics and Non-Linear Optics, Valladolid, Spain, SEDOPTICA, 11-12 de February, 2011.

GRANTS

EWU INTERNAL GRANTS

- “Characterizing noise in photonics neurons”. 2020 EWU Faculty grants of research and creative works. Awarded amount: \$9,920.
- “Permutation Indexed Entropy (PI): Development and applications”. 2022 EWU Faculty grants of research and creative works. Awarded amount: \$10,000.

EXTERNAL GRANTS

- “Characterization of complexity through photonics neurons”. 2020 Murdock Trust Partners in Science. Awarded amount: \$19,000.

NOT AWARDED GRANTS

- “Development of photonics neurons”. 2019 Faculty grants of research and creative works. Requested amount: \$5,000.
- “Photonics and Complex Dynamics Laboratory: development of photonics neurons”. 2019 EWU Start something big. Requested amount: \$41,900.

REVIEWER IN JOURNALS

Optics Express (Optica)

Chaos (American Institute of Physics)

IEEE Journal of Quantum Electronics.
Physica A (Elsevier)
Photonics Journal (IEEE)
Entropy (MDPI)
Fractals (MDPI)
Journal of Technology and Science Education.
The Physics Teacher (American Institute of Physics)

TEACHING INNOVATION

Workshop at the Spokane Public Schools PLID learning day on “Learning by creating science content videos” 21st Feb. 2020.

Journal paper: “A 3D printed wheel with constant mass and variable moment of inertia for lab and demonstrations”, E. Hazlett, and A. Aragoneses, accepted for publication at *The Physics Teacher* (2018).

Journal paper: “Disclosure day on relativity: A science activity beyond the classroom”, A. Aragoneses, N. Salán, A. Hernández. *World Journal on Educational Technology*, **9**, 2, 59-66 (2017).

Journal paper: “Teaching Engineering with Autonomous Learning Tools: Good Practices in GRAPAU-RIMA”, J. Marcé-Nogué, N. Salán, A. Aragoneses, E. Bernat, C. Escreig, B. Otero, E. Rupérez, S. Illescas. *Procedia Social Behaviorar Sciences*, **24**, 629 (2012).

Talk in conference: “Physapps: Physics at your smart phone”, at Teaching Conference of the department of Physics and Nuclear Engineering, Polytechnic University of Catalonia, 2014, Barcelona, Spain.

Talk in conference: “Teaching Physics through a conference for the broad audience”, at Teaching Innovation Conference 2013, Polytechnic University of Catalonia.

Talk in conference: “Teaching Physics through movies”, at Teaching Innovation Conference 2012, Polytechnic University of Catalonia.

Poster in conference: “Poster presentation as a teaching tool”, at World Conference on Educational Sciences 2012, Barcelona, Spain.

RESEARCH PROJECTS WITH UNDERGRADUATE STUDENTS

- Benjamin Novak, Characterization of chaos in 2D, EWU, USA, Fall 2022
- Ryan Breithaupt, *Neural networks and chaos*, EWU, WA, USA, Fall 2021, Winter 2022, Spring 2022, and Fall 2022.
- Nhat Nguyen, *Modulating Lasers*, EWU, WA, USA, Winter 2021, Winter 2022, and Spring 2022.
- Layla Abrams, *Characterizing Lasers*, EWU, WA, USA, Winter 2021.

- David Spichak, *Chaos and complexity 4*, EWU, WA, USA, Winter 2021.
- David Spichak, *Chaos and complexity 3*, EWU, WA, USA, Autumn 2020.
- David Spichak, *Chaos and complexity 2*, EWU, WA, USA, Summer 2020.
- David Spichak, *Chaos and complexity*, EWU, WA, USA, Spring 2020.
- Layla Abrams, *Complexity and Lasers*, EWU, WA, USA, Winter 2020.
- Thomas Redder, *Complexity and Lasers*, EWU, WA, USA, Winter 2020.
- Jeffrey Rew, *Chaos in an oscillator*, EWU, WA, USA, Summer 2019.
- Taylor Mundel, *Diode Laser characterization*, EWU, WA, USA, Spring 2019.
- Joel Parkins, *Quantum Key Distribution: an educational approach*, EWU, WA, USA, Autumn 2018. • Daniel Kupetsky, *Characterizing complexity of chaotic iterative maps*, Carleton College, MN, USA, Summer 2018.
- Yingqi Ding, *Quantifying the complexity of the Duffing oscillator with permutation entropy*, Carleton College, MN, USA, Spring 2018.
- Meritxell Colet, *Analysis of the dynamics of a Duffing oscillation in the classical to quantum transition*, Carleton College, MN, USA, Winter 2018.
- Maddie Khyl, *Time scale analysis of the transition regime of a Raman laser*, Carleton College, MN, USA, Fall 2017.
- Max Trostel, *Complexity analysis of Duffing oscillator through symbolic analysis*, Carleton College, MN, USA, Fall 2017.
- Daniel Kupetsky, *Study of the complexity in the transition regime of a Raman laser*, Carleton College, MN, USA, Summer 2017 .
- Meritxell Colet, *Analysis of nonlinear dynamics of semiconductor lasers with optical feedback*, Carleton College, MN, USA, Summer, Fall 2017.
- Merrilyn Goldberg, *Analysis of time and magnitude correlations in earthquake dynamics*, Carleton College, MN, USA, Spring 2017.
- Max Trostel, *Exploring complexity in quantum systems through statistical tools*, Carleton College, MN, USA, Fall 2016.

RESEARCH PROJECTS WITH HIGH-SCHOOL STUDENTS

Erik Salgado, *Quantum Key Distribution with entangled photons*. Durham, North Carolina, 2015.

Adrian Sanchez, *Relativistic photography*. Awarded with the second prize “Terrassa best high-school research on science 2011”. Terrassa, Spain, 2011.

Mariona Heras, *Black holes in literature*. Terrassa, 2012.

Irina Espejo *General relativity and its fairness in cinema*. Terrassa, 2013.

SCIENCE COMMUNICATION

- Several presentations (ongoing) on Physics at different venues in the Spokane area (Spokane Public Library, Golden Handle Project, The Hive).

- Organizer of science outreach panels and talks at EWU.
- Creator of a YouTube channel to do teaching and outreach of physics: <https://www.youtube.com/channel/UCi8OCrQwgwWzTaZ0DKLz3AA>
- Co-chair of Outreach at the Duke University Postdoctoral Association (2016).
- Winner of the “Elevator pitch contest” for Duke University postdocs 2015.
- Science writer for the electronic journal Coolscience (2015).
- Collaborator in a radio program with a science section in a region-scope radio station (2010-2014).
- Coordinator and journalist of the science section at the newspaper NewT (www.newt.cat), from 2013 to 2014.
- President of the Astronomical Association of Terrassa (Spain) from 2012 to 2014.
- President of the Association Planeta da Vinci (2011-present).
- 2015 Teacher of Science versus science fiction at OLLI (Osher Lifelong Learning Institute) at Duke University (at present).
- Organizer and director of several “Conferences on Popular Science” for the broad audience, on different physics subjects, such as Relativity, Quantum Physics, Classical Physics, Science vs. Pseudoscience, Science and Arts (2008-2015).
- Finalist in a statewide contest of science communication in Spain, “Science in action 2014” with a scientific theater play.
- Lecturer for the general audience and for high school students on different aspects of Physics, at High Schools and museums (2007-2014).
- Teacher of different science and society courses at different social institutions and museums in Barcelona, Spain (2012-2014).
- Co-founder of the Association Planeta da Vinci for the dissemination of science (www.planetadavinci.com).
- Creator of the blog www.andresaragoneses.weebly.com with regular publications on current science.
- Creator of the blog <https://planetadavinci.wordpress.com/> with regular publications on current science.
- Creator of the web www.relatividadespecial.com to coordinate the course “Special Relativity” at Polytechnic University of Catalonia from 2008 to 2012.

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