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Research Interests:

1. Neural circuitry of the visual cortex
2. Function of thalamic and cortical circuits in receptive field construction
3. The neural circuitry of visual attention

EDUCATION

- 1992 Ph.D. Neuroscience, Universidad Autónoma de Madrid, Madrid, Spain
1989 M.S. Universidad de Santiago de Compostela, Santiago, Spain.
1989 M.D. Universidad de Santiago de Compostela, Santiago, Spain.

PROFESSIONAL POSITIONS

- 2007- Professor, Dept. of Biological Sciences, SUNY College of Optometry, New York, NY.
2004-2007 Associate Professor with tenure, Dept. of Biological Sciences, SUNY College of Optometry, New York, NY.
2002- Associate Professor, Dept. of Biological Sciences, SUNY College of Optometry, New York, NY.
1999-2001 Assistant Professor, Dept. of Psychology, University of Connecticut, Storrs, CT.
1995-1999 Research Associate, Laboratory of Neurobiology, Rockefeller University, New York, NY.
1993-1995 Postdoctoral Fellow with Torsten N. Wiesel (Nobel prize winner) and Clay Reid, Laboratory of Neurobiology, Rockefeller University, New York, NY.

RESEARCH AWARDS

- 1999-2012 P.I. NIH RO1 EY05253
2008-2010 P.I. NIH R21 NS059753
2003-2008 P.I. NIH RO3 EY14345
2001-2004 CoPI. NIH RO3 EY13788
2006 SUNY Chancellor's award for Excellence in Scholarship and Creative Activities
2006 Faculty Member, Faculty of 1000 Biology
2003 SUNY Chancellor's award for Research Excellence
1995-1996 Revson Fellowship
1993-1994 Fulbright Fellowship
1990-1992 Fellowship from Formación de Personal Investigador del Ministerio de Educación y Ciencia.
1989-1990 Fellowship from Diputación Provincial de Galicia
1985-1989 Fellowship from Xunta de Galicia

PUBLICATIONS

- Alonso, J. M., C. I. Yeh and C. R. Stoelzel (2008). Visual stimuli modulate precise synchronous firing within the thalamus (special issue in honor of Mircea Steriade). Thalamus and Related Systems (published online by Cambridge University Press on 04 January 2008).
- Chen, Y., Martinez-Conde, S., Macknik, S.L., Bereshpolova, Y., Swadlow, H.A., Alonso, J.M. (2008) Task difficulty modulates the activity of specific neuronal populations in primary visual cortex. *Nat Neurosci* 11 (8): 975-982. (Featured in News and Views by John Reynolds).
- Jin, J. Z., C. Weng, C. I. Yeh, J. A. Gordon, E. S. Ruthazer, M. P. Stryker, H. A. Swadlow and J. M. Alonso (2008). On and off domains of geniculate afferents in cat primary visual cortex. Nat Neurosci 11(1): 88-94. (Cover of this Nature Neuroscience issue).

- Butts, D.A., C. Weng, J. Jin, C.I. Yeh, N.A. Lesica, J.M. Alonso and G.B. Stanley (2007) Temporal precision in the neural code and the time scales of natural vision. Nature 449:92-95.
- Lesica, N. A., J. Jin, C. Weng, C. I. Yeh, D. A. Butts, G. B. Stanley and J. M. Alonso (2007). "Adaptation to Stimulus Contrast and Correlations during Natural Visual Stimulation." Neuron 55(3): 479-91.
- Alonso, J. M. (2007). El talamo y la vision. Investigacion y Ciencia 22: 26-32.
- Alonso, J. M. (2006). Neurons find strength through synchrony in the brain. Science 312: 1604-05.
- Alonso, J. M. (2006). La vía visual cien años después de Ramón y Cajal. Santiago Ramón y Cajal. Cien años después. A. G. y. A. Ferrús. les Illes Balears, Editorial Pirámide - Universitat de les Illes Balears: 233-255.
- Alonso, J. M., C. I. Yeh, C. Weng and C. Stoelzel (2006). Chapter 1 Retinogeniculate connections: a balancing act between connection specificity and receptive field diversity. Prog Brain Res 154: 3-13.
- Bezdudnaya, T., M. Cano, Y. Bereshpolova, C. R. Stoelzel, J. M. Alonso and H. A. Swadlow (2006). Thalamic Burst Mode and Inattention in the Awake LGNd. Neuron 49(3): 421-32.
- Cano, M., T. Bezdudnaya, H. A. Swadlow and J. M. Alonso (2006). Brain state and contrast sensitivity in the awake visual thalamus. Nat Neurosci 9(10): 1240-2.
- Lesica, N. A., C. Weng, J. Jin, C. I. Yeh, J. M. Alonso and G. B. Stanley (2006). Dynamic Encoding of Natural Luminance Sequences by LGN Bursts. PLoS Biol 4(7): e209.
- Veredas FJ, Vico FJ, Alonso JM (2006) Evolving networks of integrate and fire neurons. Neurocomputing 69:1561-1569.
- Alonso, J. M. (2005). "Building better models of visual cortical receptive fields." Neuron 46(6): 842-4.
- Alonso, J. M. and H. A. Swadlow (2005). "Thalamocortical specificity and the synthesis of sensory cortical receptive fields." J Neurophysiol 94(1): 26-32.
- Martinez, L. M., Q. Wang, R. C. Reid, C. Pillai, J. M. Alonso, F. T. Sommer and J. A. Hirsch (2005). "Receptive field structure varies with layer in the primary visual cortex." Nat Neurosci 8(3): 372-9.
- Veredas, F. J., F. J. Vico and J. M. Alonso (2005). "Factors determining the precision of the correlated firing generated by a monosynaptic connection in the cat visual pathway." J Physiol 567(Pt 3): 1057-78.
- Weng, C., C. I. Yeh, C. R. Stoelzel and J. M. Alonso (2005). "Receptive field size and response latency are correlated within the cat visual thalamus." J Neurophysiol 93(6): 3537-47.
- Veredas, F. J., F. J. Vico and J. M. Alonso (2004). "A computational tool to simulate correlated activity in neural circuits." J Neurosci Methods 136(1): 23-32.
- Hirsch, J. A., L. M. Martinez, C. Pillai, J. M. Alonso, Q. Wang and F. T. Sommer (2003). "Functionally distinct inhibitory neurons at the first stage of visual cortical processing." Nat Neurosci 6(12): 1300-8.
- Martinez, L. M. and J. M. Alonso (2003). "Complex receptive fields in primary visual cortex." Neuroscientist 9(5): 317-31.
- Yeh, C. I., C. R. Stoelzel and J. M. Alonso (2003). "Two different types of Y cells in the cat lateral geniculate nucleus." J Neurophysiol 90(3): 1852-64.
- Alonso, J. M. (2002). "Neural connections and receptive field properties in the primary visual cortex." Neuroscientist 8(5): 443-56.
- Alonso-Lopez, J. M. (2002). "[Visual pathways: a set of time-saving strategies]." Rev Neurol 35(5): 446-51.

- Hirsch, J. A., L. M. Martinez, J. M. Alonso, K. Desai, C. Pillai and C. Pierre (2002). "Synaptic physiology of the flow of information in the cat's visual cortex in vivo." J Physiol 540(Pt 1): 335-50.
- Martinez, L. M., J. M. Alonso, R. C. Reid and J. A. Hirsch (2002). "Laminar processing of stimulus orientation in cat visual cortex." J Physiol 540(Pt 1): 321-33.
- Reid, R. C., J. M. Alonso and W. M. and Usrey (2002). Integration of thalamic inputs to cat primary visual cortex. The cat primary visual cortex. B. R. Payne and A. Peters, Academic Press. **8**: 319-337.
- Alonso, J. M., W. M. Usrey and R. C. Reid (2001). "Rules of connectivity between geniculate cells and simple cells in cat primary visual cortex." J Neurosci 21(11): 4002-15.
- Martinez, L. M. and J. M. Alonso (2001). "Construction of complex receptive fields in cat primary visual cortex." Neuron 32(3): 515-25.
- Cecchi, G. A., M. Sigman, J. M. Alonso, L. Martinez, D. R. Chialvo and M. O. Magnasco (2000). "Noise in neurons is message dependent." Proc Natl Acad Sci U S A 97(10): 5557-61.
- Usrey, W. M., J. M. Alonso and R. C. Reid (2000). "Synaptic interactions between thalamic inputs to simple cells in cat visual cortex." J Neurosci 20(14): 5461-7.
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- Dan, Y., J. M. Alonso, W. M. Usrey and R. C. Reid (1998). "Coding of visual information by precisely correlated spikes in the lateral geniculate nucleus." Nat Neurosci 1(6): 501-7.
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- Hirsch, J. A., C. A. Gallagher, J. M. Alonso and L. M. Martinez (1998). "Ascending projections of simple and complex cells in layer 6 of the cat striate cortex." J Neurosci 18(19): 8086-94.
- Alonso, J. M., W. M. Usrey and R. C. Reid (1996). "Precisely correlated firing in cells of the lateral geniculate nucleus." Nature 383(6603): 815-9.
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- Hirsch, J. A., J. M. Alonso and R. C. Reid (1995). "Visually evoked calcium action potentials in cat striate cortex." Nature 378(6557): 612-6.
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- Alonso, J. M., J. Cudeiro, R. Perez, F. Gonzalez and C. Acuna (1993). "Influence of layer V of area 18 of the cat visual cortex on responses of cells in layer V of area 17 to stimuli of high velocity." Exp Brain Res 93(2): 363-6.
- Alonso, J. M., J. Cudeiro, R. Perez, F. Gonzalez and C. Acuna (1993). "Orientational influences of layer V of visual area 18 upon cells in layer V of area 17 in the cat cortex." Exp Brain Res 96(2): 212-20.
- Gonzalez, F., F. Krause, R. Perez, J. M. Alonso and C. Acuna (1993). "Binocular matching in monkey visual cortex: single cell responses to correlated and uncorrelated dynamic random dot stereograms." Neuroscience 52(4): 933-9.

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CONFERENCE PRESENTATIONS & ABSTRACTS

- Chen, Y., Martinez-Conde, S., Macknik, S., Bereshpolova, Y., Swadlow, H.A., Alonso, J.M. (2007) Attentional load modulates the activity of distinct populations of neurons within primary visual cortex. Program No. 931.18. *2007 Neuroscience meeting planner*. Atlanta, GA: Society for Neuroscience, 2007. Online.
- Besbordes, G., Weng, C., Jin, J., Butts, D.A., Alonso, J.M., Stanley, G.B. (2007) How correlated is the neural code entering primary visual cortex? Program No. 615.1. *2007 Neuroscience meeting planner*. Atlanta, GA: Society for Neuroscience, 2007. Online.
- Butts, D.A., Jin, J., Weng, C., Lesica, N.A., Stanley, G.B., Alonso, J.M., Paninski, L. (2007) Tuned 'suppression' in the LGN underlies millisecond precision and has significant implications for visual coding. Program No. 615.3. *2007 Neuroscience meeting planner*. Atlanta, GA: Society for Neuroscience, 2007. Online.
- Jin, J., Yeh, Weng, C., Anand, S., Swadlow, H.A., Alonso, J.M. (2007) Receptive field arrangement of thalamic afferents within an orientation domain in cat primary visual cortex. Program No. 920.10. *2007 Neuroscience meeting planner*. San Diego, CA: Society for Neuroscience, 2007. Online.
- Weng, C., Jin, J., Yeh, C.I., Alonso, J.M. (2007) Influence of contrast on the spatial frequency tuning of neuronal populations in the cat visual thalamus. Program No. 392.29. *2007 Neuroscience meeting planner*. San Diego, CA: Society for Neuroscience, 2007. Online.
- Butts, D.A., Weng, C., Jin, J., Yeh, C.I., Lesica, N.A., Alonso, J.M., Stanley, G.B. (2006) The role of temporal precision in the neural code and its relationship to the time scales of natural stimuli. Program No. 734.22. *2006 Neuroscience meeting planner*. Atlanta, GA: Society for Neuroscience, 2006. Online.
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- Bezdudnaya, T., Cano, M., Alonso, J.M., Swadlow, H.A. (2005) Inattentive vision and 'burst mode' in awake subjects: temporal tuning in the LGNd. Program No. 506.11. *2005 Abstract Viewer/Itinerary Planner*. Washington, DC: Society for Neuroscience, 2005.
- Butts, D.A., Weng, C., Jin, J.Z., Yeh, C.I., Lesica, N.A., Alonso, J.M., Stanley, G.B. (2005) Changes in functional properties of LGN neurons with contrast and their significance in information transmission. Program No. 855.3. *2005 Abstract Viewer/Itinerary Planner*. Washington, DC: Society for Neuroscience, 2005.
- Cano, M., Bezdudnaya, T., Alonso, J.M., Swadlow, H.A. (2005) The contrast response function of the awake LGN is accurately scaled during state transitions. Program No. 506.10. *2005 Abstract Viewer/Itinerary Planner*. Washington, DC: Society for Neuroscience, 2005.
- Chen, Y., Martinez-Conde, S., Macknik, Bereshpolova, Y., S., Swadlow, H., Alonso, J.M. (2005) Detection difficulty increases neuronal activity in primary visual cortex. Program No. 286.14. *2005 Abstract Viewer/Itinerary Planner*. Washington, DC: Society for Neuroscience, 2005.
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- Lesica, N.A., Weng, C., Jin, J.Z., Yeh, C.I., Butts, D.A., Alonso, J.M., Stanley, G.B. (2005) The effects of contrast adaptation during natural stimulation. Program No. 855.2. *2005 Abstract Viewer/Itinerary Planner*. Washington, DC: Society for Neuroscience, 2005.
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- Yeh, C.I., Stoelzel, C.R., Weng, C., Alonso, J.M. (2004) Wiring specificity of the Y pathway in the cat lateral geniculate nucleus. *Abstract Viewer/Itinerary Planner*

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- Cano, M., Bezudnaya, T., Swadlow, H.A., Alonso, J.M. (2003) How changes in arousal affect visual contrast sensitivity. *Abstract Viewer/Itinerary Planner Washington, DC: Society for Neuroscience, 2003 CD-ROM: Program No. 551.5, 2003.*
- Martinez, L.M., Alonso, J.M., Hirsch, J.A. (2003) Synaptic structure of receptive fields in the cat's early visual pathway. *Abstract Viewer/Itinerary Planner Washington, DC: Society for Neuroscience, 2003 CD-ROM: Program No. 910.19, 2003.*
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- Alonso, J.M., Stoelzel, C.R., Yeh, C.I. (2001). A role for precise spike timing in the lateral geniculate nucleus: detecting stimulus transients. *Society for Neuroscience Abstracts, 27, Prog. No. 821.56.*
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- Cechi, G.A., Sigman, M., Alonso, J.M., Martinez, L., Chialvo, D., Magnasco, M.O. (1999) Noise in neurons is message dependent. *Society for Neuroscience Abstracts 25: 359.*
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- Alonso, J.M., Martinez, L.M. (1998) The generation of complex receptive fields in the superficial layers of the cat visual cortex. *Soc Neurosci Abstr 24, 1756.*
- Alonso JM, Martinez LM (1997) Connectivity between simple cells and complex cells in cat visual cortex. *Soc. Neurosci. Abstr. 23:1668.*
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- Hirsch JA, Alonso JM, Reid RC (1995) Two dimensional spatial maps of excitation and inhibition in the simple receptive field. *Soc. Neurosci. Abstr.* 21:21.
- Reid RC, Alonso JM, Wiesel TN (1994) Rules determining the monosynaptic connections between LGN cells and simple cells in the cat visual cortex. *Soc Neurosci Abstr* 20:1476.
- Alonso JM, Reid RC (1994) Coupling between neighboring LGN cells: possible implications for simple receptive fields. *Soc Neurosci Abstr* 20:1476.
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- Pérez R, Alonso JM, Cudeiro J, González F, Krause F, Acuña C (1987) Adrenergic receptors in the visual cortex of the cat. Distribution and functional role. International Meeting on Visual Neuroscience, 10.

INVITED TALKS

Baylor College of Medicine (Houston), Brown University (Providence), California Institute of Technology (Los Angeles), City University of New York (Manhattan, New York), City University of New York (Queens, New York), Columbia University (New York), Drexel University (Philadelphia), Cosyne 2008 (Salt Lake City), Harvard Medical School (Boston), Ludwig-Maximilians-University Munich (Munich, Germany), Mount Sinai School of Medicine (New York), New York University (New York), Northwestern University (Evanston), Physiological Society of London (Cambridge, UK), Salk Institute (San Diego), Spanish Society for Neuroscience (Santiago de Compostela, Spain), Spanish Society for Neuroscience (Valladolid, Spain), Spanish Society of Psychiatry (Vigo, Spain), State University of New York (Stonybrook, Long Island), State University of New York (College of Optometry, Manhattan), University College of London (London, UK), University of California (Los Angeles), University of Connecticut (Storrs), University of Malaga (Malaga, Spain), University of Montreal (Montreal, Canada), University of Pennsylvania (Philadelphia), University of Santiago de Compostela (Santiago de Compostela, Spain), Yale University (New Haven), Weill Medical College of Cornell University (New York).

POSTDOCTORAL FELLOWS

Luis M. Martinez. Associate Professor, Neuroscience Institute of Alicante, Spain.
 Monica Cano Viñas. Postdoctoral student at Yale University.
 Yao Chen. Current postdoctoral student
 Jianzhong Jin. Current postdoctoral student

Ph.D. and M.S. STUDENTS

Francisco J. Veredas (Ph.D.). Associate Professor, University of Malaga, Spain.
 Carl Stoelzel (M.S.) Postdoctoral student, University of Connecticut.
 Chun-I Yeh (Ph.D.) Postdoctoral student, New York University.
 Chong Weng (Ph.D) Actuary Science student, Columbia University
 Yushi Wang (M.D., M.S.) Current Ph.D. student.
 Sanjiv Anand (M.D.) Current M.S. student

UNDERGRADUATE RESEARCH STUDENTS

Jason Bachand. Graduated May, 1999.
Catherine Takacs. Graduated May, 2000.
Lucia Perfetti. Graduated May, 2000.
Michael Eglinton. Graduated May, 2001
Stephanie Hyer. Graduated May, 2002
Michael McKee. Graduated May, 2001
Monika Pychynska. Graduated May, 2001
Eric Rey. Graduated May, 2001.
Bosko Trputec. Graduated May, 2001.

TEACHING EXPERIENCE

Ocular Anatomy and Physiology, Optometry students (2007)
Sensation and Perception (University of Connecticut). Undergraduate students (1999-2001)
Sensation and Movement (University of Connecticut). Graduate students (2002).
Seminars in Behavioral Neuroscience (University of Connecticut). Graduate students (2001-2002).

UNIVERSITY COMMITTEES

Institutional Animal Care and Use Committee (IACUC) at The University of Connecticut (1999-2002) and SUNY College of Optometry (2002-).
Thesis committees at the University of Connecticut (Connecticut), University of Malaga (Malaga, Spain), Mount Sinai School of Medicine (New York), University College of London (London) and University of Pennsylvania (Philadelphia).
Chairman of the Committee on graduate admissions at SUNY College of Optometry (2005-).
Dean Search Committee at SUNY College of Optometry (2008), Research Council at SUNY Optometry (2002-), Faculty Executive Committee at SUNY Optometry (2007-), Strategic Planning Committee at SUNY Optometry (2008-), Presidential Inauguration Committee at SUNY Optometry (2008-).

GRANT REVIEWS

Arizona Biomedical Research Commission (USA)
Biomedical Research Council of Singapore (Singapore)
Biotechnology and Biological Sciences Research Council (UK)
City University of New York (USA)
National Institutes of Health (USA)

- Scientific Review IFCN-8 (2003)
- Scientific Review ZRG1 F02B (2003-2006)
- Scientific Review SMI (2006)
- Scientific Review ZRG1-IFCN-B-03M (2007)
- Scientific Review NEI for K99s (2007)
- Scientific Review NEI for K08s, K23s, K99s and T32s (2007)
- Chairman of Scientific Review ZRG1 F02B (2008)
- Scientific Review NEI LRP (2008)
- Member of Scientific Review NEI CVP (2008-2012)

National Science Foundation (USA)
Netherlands Organization for Scientific Research (The Netherlands)
Research Foundation at the University of Connecticut (USA)

The Israel Science Foundation (Israel)
The Wellcome Trust (UK)

JOURNAL REVIEWS

Brain Research, Cerebral Cortex, Experimental Brain Research, Journal of Neurophysiology, Journal of Neuroscience, Journal of Neuroscience Methods, Journal of Vision, Nature, Nature Neuroscience, Neuron, Open Neuroscience Journal, Proceedings of the National Academy of Sciences, Perception, Progress in Neurobiology, Vision Research, Visual Neuroscience, Science.

EDITORIAL BOARDS

Journal of Optometry, Thalamus and Related Systems, Frontiers in Integrative Neuroscience.