

## **SEMINARIO**

**Viernes, 28 de junio de 2024  
12:30 h. Instituto Cajal (CSIC) Madrid**

### **DRA. ANA AMADOR**

**DEPT. DE FÍSICA, UNIVERSIDAD BUENOS AIRES,  
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BUENOS AIRES, ARGENTINA**

# **Low dimensional neural dynamics underlying the generation of rhythmic vocal behavior in canaries**

## Abstract

Singing is a complex motor activity that emerges from the interaction between the central and peripheral nervous systems, with the body and the environment. The similarities between birdsong and human speech, both in production and learning, have positioned songbirds as highly useful animal models to study this learned motor skill.

In this talk I will show an interdisciplinary approach to study the emergence of rhythmic vocal behavior. Specifically I will present neuronal recordings in a telencephalic region where sensori-motor integration occurs, showing the presence of well-defined oscillations in local field potentials, which are synchronized to the song rhythms of adult male canaries (*Serinus canaria*). Moreover, using machine learning techniques to study the underlying structure in multi-unit recordings, we find a low dimensional representation that is related with behavior. Our results demonstrate a tight link between peripheral and central dynamical patterns of activity during singing.

## Affiliation and short bio

Ana Amador is a professor at the Physics Department of the School of Science at the University of Buenos Aires, Argentina, since 2018. She is also an Independent Investigator at the National Scientific and Technical Research Council of Argentina (CONICET) since 2013.

Ana is an interdisciplinary neuroscientist with background in physics. Her research interests are biomechanics, neurophysiology, neuroethology, non-linear dynamics and, in a more specific area, the production and perception of vocalizations in songbirds.

In 2009, Ana won a cross-disciplinary scholarship from the Human Frontiers Science Program Organization to perform postdoctoral studies and research with Daniel Margoliash at the University of Chicago, USA. In 2012 she returned to Argentina to develop an innovative experimental line which includes the recording of neuronal bio-potentials in behaving animals and mathematical modeling within the framework of Nonlinear Dynamics. Ana is currently the vice-Dean of the Physics Department of the School of Science at the University of Buenos Aires, councilor at the International Society of Neuroethology, and president of the Buenos Aires branch of the Argentine Physics Association (AFA).