Examples of *Future Fellowships* projects commencing in 2014

**Australian Capital Territory**

Australian Capital Territory (ACT) research organisations will receive more than $12.5 million through the Australian Research Council *Future Fellowships* scheme for 17 new research projects commencing in 2014.

Some examples of the ACT projects are provided below.

To view the summaries of all successful projects, visit the [ARC announcements page](#).

**The Australian National University**  
**Future Fellow:** Dr Ajay Narendra (FT140100221)  
**Summary:** Ensuring optimal information processing at the limits of size and ambient light is a challenge for technical systems, but has been elegantly solved by animals. The challenge of navigation is similar for animals of all sizes and in both day and night. This project aims to conduct a comparative analysis to identify the consequence of size and light on the information processing capacities for visual navigation. Outcomes of this project will reveal the behavioural and physiological adaptations needed and the costs associated with navigating in the dimmest of habitats and at the smallest of sizes. Identifying such optimal biological solutions for robust navigation will be relevant for image processing, computer vision and robotics.  
**ARC funding:** $770 507 over four years

**The Australian National University**  
**Future Fellow:** Dr Julie Smith (FT140101260)  
**Summary:** Innovation affecting human milk supply challenges current regulation of infant food, but new markets in human milk assist the economic valuation of breastfeeding. Mothers are finding new ways to share their milk, and milk banking and human milk-based products are emerging as alternatives to commercial infant formula. This project builds on previous world-leading Australian research into the economics of breastfeeding. It aims to increase understanding of markets in milk for infants and inform regulation of milk markets and milk exchange. It will investigate key features of these markets, how milk is priced, and how to access data on market prices which might improve the social and economic valuation of breastfeeding.  
**ARC funding:** $702 375 over four years

**The Australian National University**  
**Future Fellow:** Dr Susan Harris Rimmer (FT140100084)  
**Summary:** This project aims to examine the link between diplomatic negotiations and their impact on the shifting status of women during times of deep political change. It will assess three key areas of international diplomatic negotiations around peace agreements, aid, and security sector reform and assess how these negotiations affected women's status on the ground. It will seek to design approaches to diplomatic interventions that may be more cognisant of gendered impacts and aim to benefit women.  
**ARC funding:** $653 993 over four years
The Australian National University

**Future Fellow:** Dr Helen McGregor (FT140100286)

**Summary:** El Niño and La Niña events have a profound influence on Australian drought conditions and rainfall. Forecasting is hampered by short climate records, which do not capture the full range of El Niño dynamics. This project aims to generate records of unprecedented length and spatial coverage from key sites across the western and central equatorial Pacific. Five hundred years of continuous, monthly resolution climate data will be integrated with output from state-of-the-art climate model simulations to distil the key processes that cause El Niño to vary. This project aims to provide major advances in determining the full range of El Niño and La Niña behaviour, leading to improved forecasts of future changes, with consequences for Australia’s water security.

**ARC funding:** $771,360 over four years

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The Australian National University

**Future Fellow:** Dr Vanessa Robins (FT140100604)

**Summary:** The way water flows through sandstone depends on the connectivity of its pores, the balance of forces in a grain silo on the contacts between individual grains, and the impact resistance of metal foam in a car door on the arrangement of its cells. These structural properties are described mathematically by topology. Advanced three-dimensional X-ray imaging can now reveal the internal detail of micro-structured materials. Recent developments in image analysis mean it is possible to compute accurate topological information from such images. This project aims to investigate how fundamental measures of shape influence the physical properties of complex materials and clarifies the mathematics that underpins these relationships.

**ARC funding:** $672,384 over four years