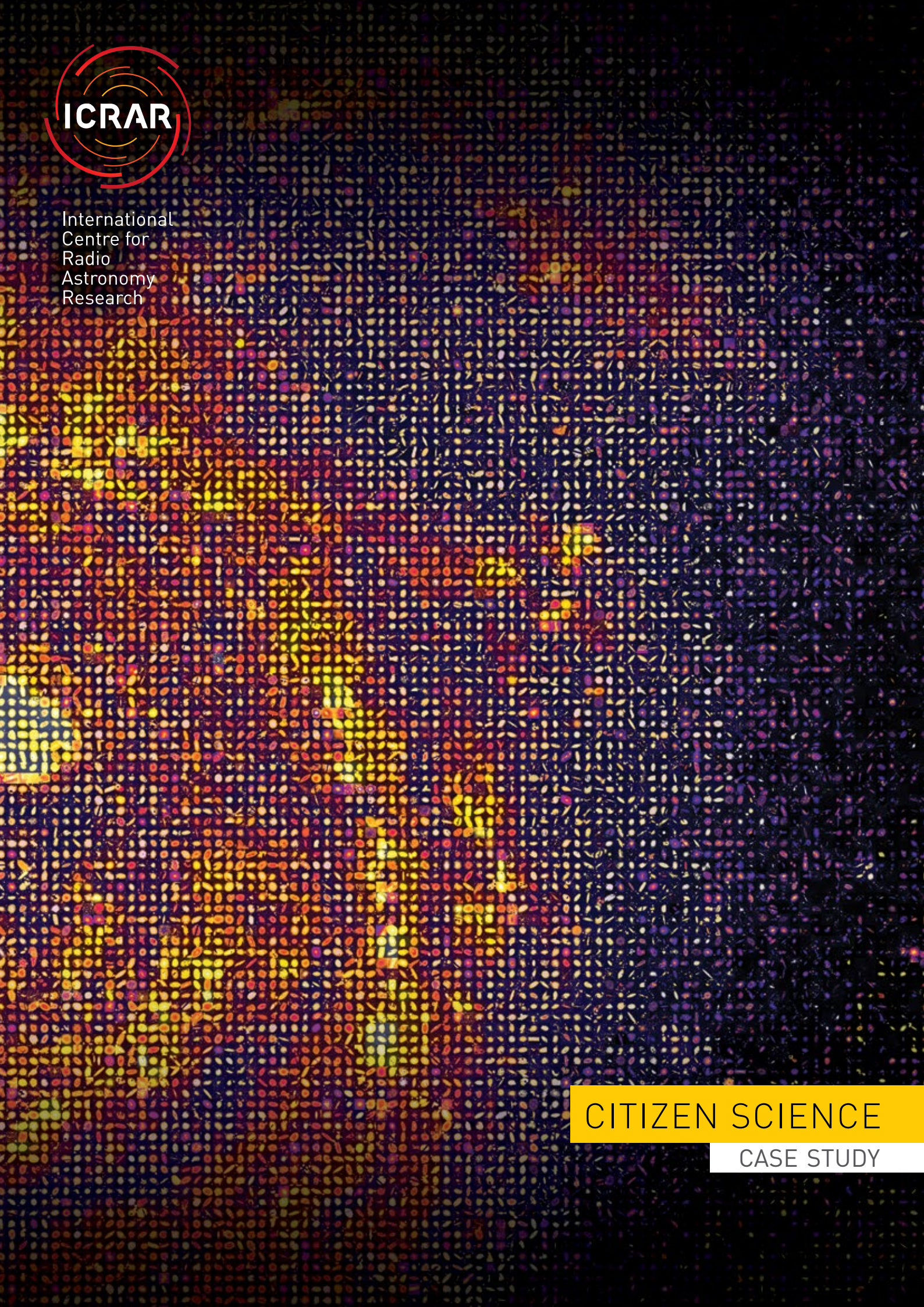
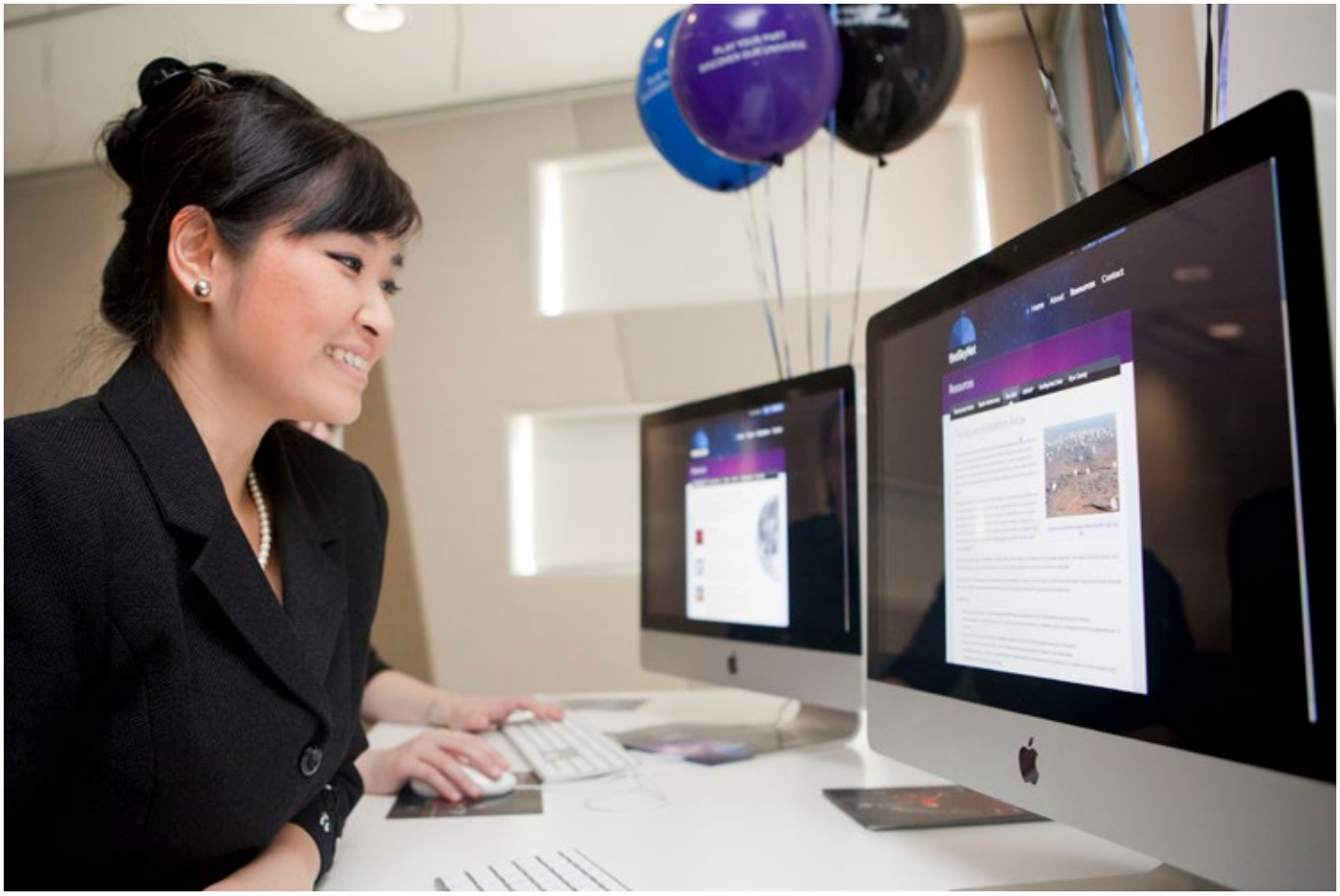

ICRAR
International
Centre for
Radio
Astronomy
Research
CITIZEN SCIENCE
CASE STUDY



CITIZEN SCIENCE

At any given time, day or night, tens of thousands of volunteers are donating their time or computing power to ICRAR's citizen science programs. The Centre is engaging the wider community in real research through three distinct projects; Galaxy Explorer, theSkyNet and Radio Galaxy Zoo.

ICRAR is passionate about giving citizen scientists the chance to make a genuine contribution to discovering more about the Universe. The Centre's citizen science journey began in 2011 with the launch of theSkyNet, a project that harnesses spare computing power during down times to help researchers process astronomical data. The initiative was the first distributed computing project based in Australia.

At any given time, day or night, almost 20,000 computers around the world are contributing to the project.

theSkyNet has helped astronomers discover the properties of hundreds of thousands of galaxies and develop automated ways of finding interesting sources in large volumes of radio data. At any given time, day or night, almost 20,000 computers around the world are contributing to the project. This adds up to a distributed network capable of performing more than one million processing tasks per week, placing theSkyNet on par with a supercomputer with between 60 and 100 TFLOPs of compute power, or just shy of a top 500 supercomputer.

Over the last six years, more than 54,000 people have processed data for theSkyNet and the website has generated more than 830,000 unique visits from 181 countries. In 2014, theSkyNet achieved a peak processing power of 106 TFLOPs, equivalent to 366 modern Intel Core i7 processors worth approximately $249,000 (excluding running costs).

The total amount of data processed by theSkyNet would take approximately 600 years on a high-performance desktop or 24 hours on the world's fastest supercomputer. The initiative has been recognised for its ability to produce

real research outcomes for astronomers while also being an innovative and effective method to engage the public in science through astronomy.

Off the back of the success of theSkyNet, ICRAR partnered with ABC Science in 2015 to develop Galaxy Explorer. This active citizen science program allows anyone to help astronomers classify galaxies up to four billion light years away. Volunteers are provided with a quick tutorial, before taking a trip to some of the furthest reaches of the Universe. Galaxy Explorer complements the work of theSkyNet, and provides data to ICRAR astronomers working on the Galaxy And Mass Assembly (GAMA) survey.

Originally developed for National Science Week, Galaxy Explorer has grown to become a powerful ongoing citizen science platform. The project's volunteers have successfully helped ICRAR's astronomers classify and measure the properties of more than 210,000 galaxies.

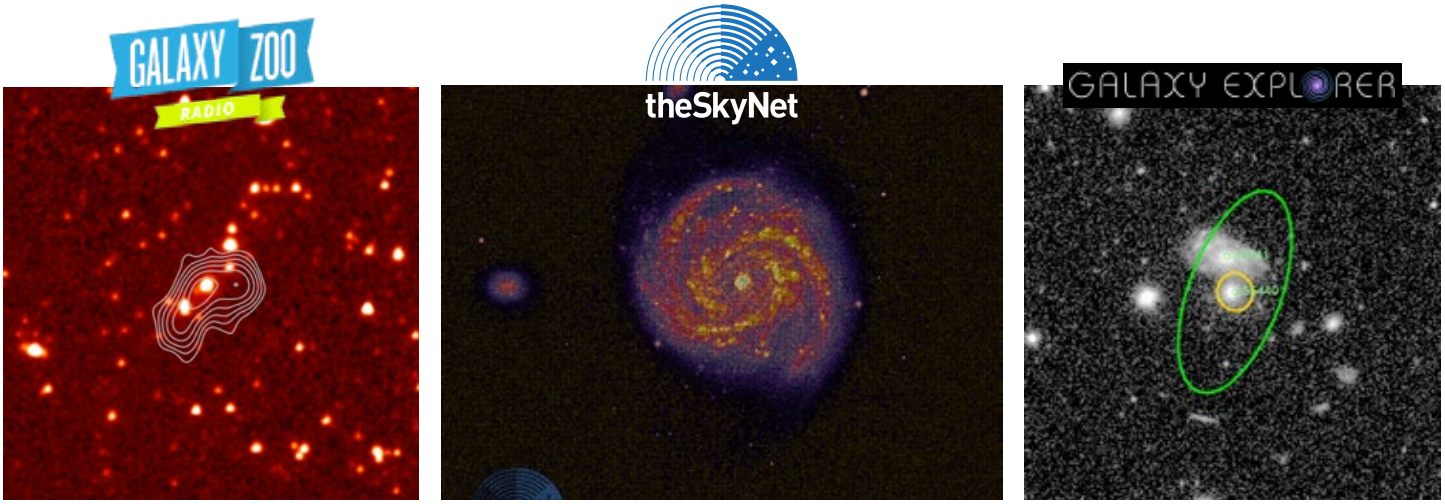
Since early 2016, ICRAR has had a dedicated postgraduate research student analysing the outputs from Galaxy Explorer and merging the galaxy sizes with other catalogues we have available. The overall improvement has been remarkable, with some very complex regions of the sky now successfully split into distinct sources, helping astronomers create a detailed atlas of the sky.

Now, Galaxy Explorer has just been awarded a $350,000 Federal Government grant to prepare data for the largest survey of galaxies the Universe has ever seen, the Wide Area Vista ExtraGalactic Survey (WAVES). Citizen scientists will conduct real astronomical analysis of images and data, and gain a practical understanding of modern astronomy and how astronomers study the distant Universe.

This expanded Galaxy Explorer program has the capacity to reach tens of thousands of global citizen scientists, and engage them in the process of analysing Australian astronomical data. The results will be essential for the success of the multimillion-dollar WAVES project, led from ICRAR.

This survey is the largest ever experiment on the evolution of galaxies, and the work of citizen scientists will have a lasting impact in the field of astronomy.

Finally, ICRAR is part of Radio Galaxy Zoo, an online project that sees citizen scientists help researchers identify galaxies hosting jet-emitting supermassive black holes. The initiative has seen more than 12,000 volunteers complete more than 1.9 million classifications. More than 95,000 radio source components have been classified and up to 40,000 radio galaxies analysed as part of the project. Radio Galaxy Zoo is co-led by ICRAR, and is part of the Zooniverse suite of citizen science projects headquartered at Oxford University and Adler Planetarium.



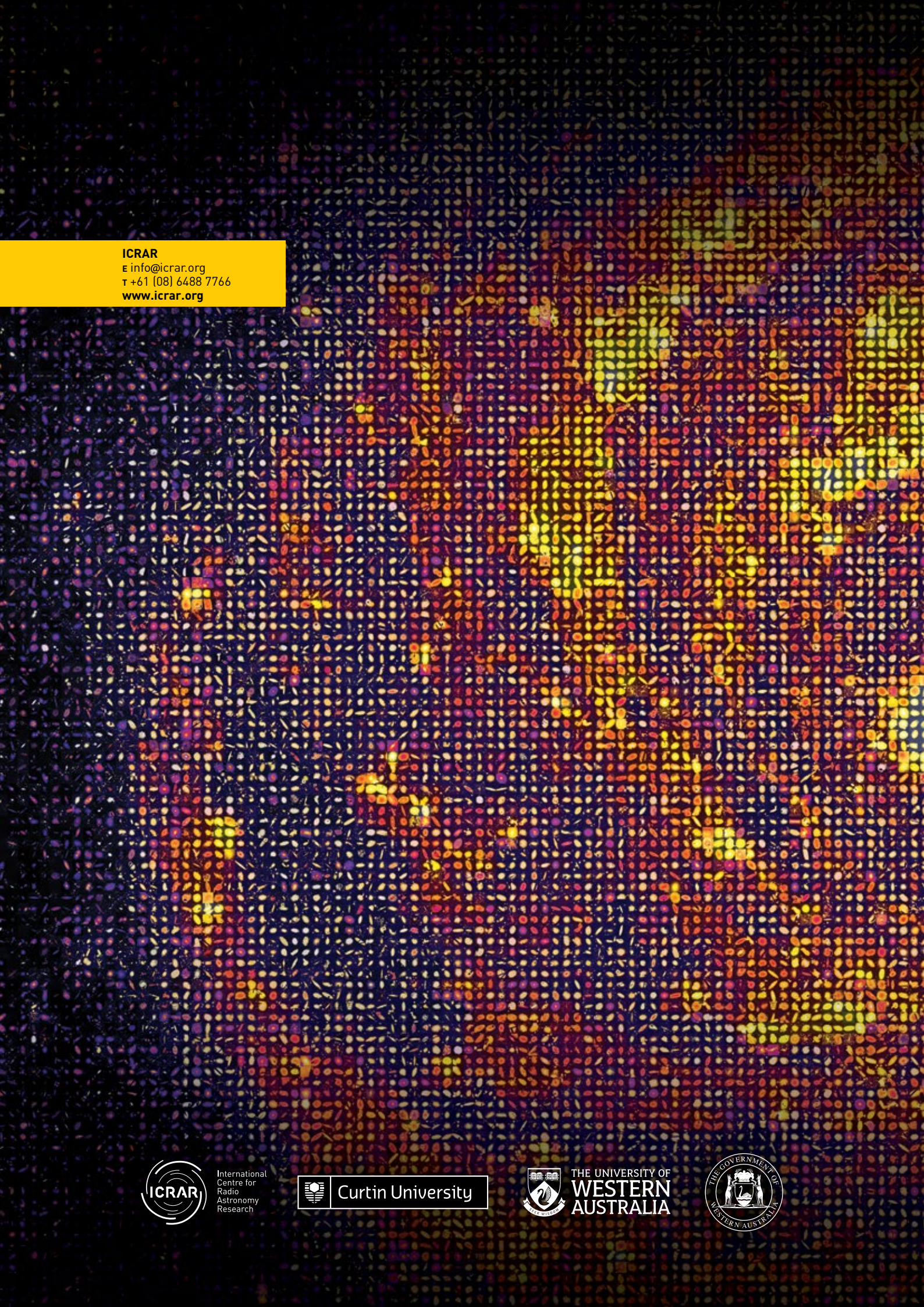
DISCOVER MORE

theSkyNet - theSkyNet.org

Galaxy Explorer - galaxyexplorer.net.au

Galaxy Zoo Radio - radio.galaxyzoo.org

Cover A mosaic of results from theSkyNet citizen science project. The overall image shows how fast stars are forming in 'nearby' galaxy Messier 100 (M100), white patches are hotbeds of new stars, purple areas are where fewer young stars are forming. Each sub image are the results from the 45,000+ galaxies theSkyNet volunteers have processed.



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