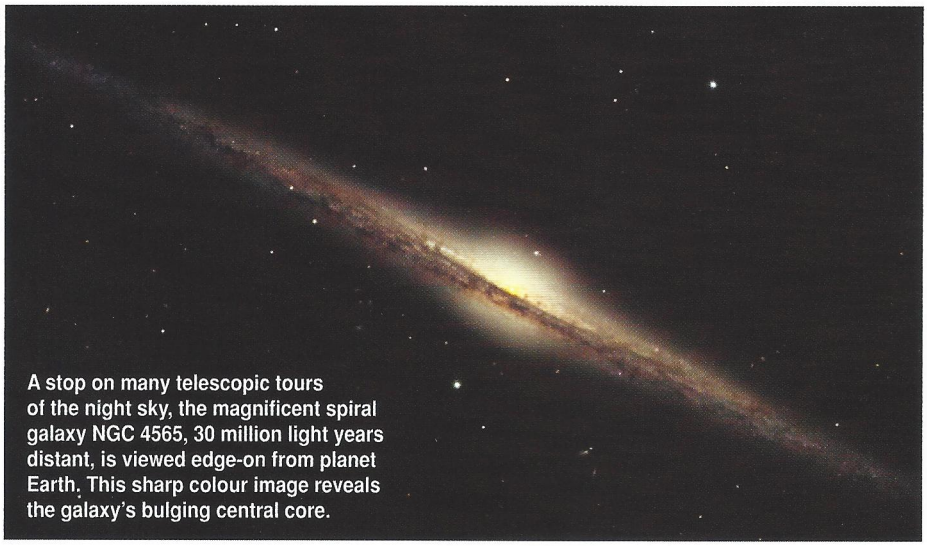

Image: Hubble/Gaul

A stop on many telescopic tours of the night sky, the magnificent spiral galaxy NGC 4565, 30 million light years distant, is viewed edge-on from planet Earth. This sharp colour image reveals the galaxy's bulging central core.

ANU finds Universe has used up a fifth of its fuel tank

The Universe has guzzled its way through about 20 per cent of its normal matter, or original fuel reserves, according to findings from a survey of the nearby Universe by an international team of astronomers involving researchers at The Australian National University (ANU).

The survey, released at the General Assembly of the International Astronomical Union (IAU) in Prague recently, revealed that about 20 per cent of the normal matter or fuel that was produced by the Big Bang 14 billion years ago is now in stars.

The survey data, which forms a 21st century database called the Millennium Galaxy Catalogue, was gathered from over 100 nights of telescope time in Australia, the Canary Islands and Chile, and contains over ten thousand giant galaxies, each of these containing 10 million to 10 billion stars.

The remaining material is almost completely in gaseous form lying both within and between the galaxies, forming a reservoir from which future generations of stars may develop.

The simplest prognosis is that the Universe will be able to form stars for a further 70 billion years or so after which it will start to go dark. However, unlike our stewardship of the Earth, the Universe is definitely tightening its belt with a steady decline in the rate at which new stars are forming.

Dr Alister Graham, an astronomer at ANU who worked on the survey, said that the team of researchers were able to determine how much of matter is in the stars through a cosmic stocktake.

"This is where the Australian telescopes played a key role," Dr Graham said.

One of the unique aspects of this program was the careful separation of a galaxy's stars into its central bulge component and surrounding disc-like structure. This allowed the researchers to determine that, on average, roughly half of the stars in galaxies reside in discs and the other half in bulges.

"Measuring the concentration of stars in each galaxy's bulge is what enabled us to determine their central super-massive black hole masses," said Dr Graham. "Some of these are up to one million billion times more massive than the Earth. Once we had these masses, it was a simple task of summing them up to determine how much of the Universe's matter is locked away in black holes at the centres of galaxies."

Dr Graham said next-generation telescopes such as the Giant Magellan Telescope, currently in production, will enable astronomers to directly measure black hole masses in galaxies ten times further away and thus ten times further back in time. "In effect, we'll soon be able to observe how galaxies and their black holes evolved into what we see around us today," he said.

Other members of the research team included Paul Allen and Ewan Cameron of The Australian National University.

Source: ANU

Female space tourist in orbit

United States entrepreneur Anousheh Ansari has been training for six months to get away from it all and now she's accomplished her dream. Even though she wasn't sporting a camera around her neck, this young woman has effectively just become one of the world's first female space tourists.

On 18 September this year, Iranian-American Ansari successfully launched aboard a Soyuz TMA spacecraft from the Baikonur Cosmodrome bound for the International Space Station. She joined the Expedition 14 crew which includes NASA astronaut Michael Lopez-Alegria and Russian cosmonaut Mikhail Tyurin for her 10-day mission.

The UK's Helen Sharman was the first female space tourist when she flew to Mir in 1991. She was selected by lottery in 1989 after responding to a radio promotion asking for applicants to be the first British astronaut. Helen Sharman was selected from over 13,000 entrants and won a trip into space.

Ansari was no ordinary passenger on her flight – she took an active part in the mission. Experiments she did in conjunction with the European Space Agency had to do with the effects of low back pain on astronauts and cosmonauts. Another experiment has been designed to better understand the mechanisms behind anaemia. In space, the blood which is normally held in the body's extremities by gravity, shifts and causes high red cell density in blood vessels.

Ansari also assisted in collecting valuable data on microbial life forms onboard the space station to detect and record the different species that have made a home for themselves there.

While in space Ansari also completed some educational programs on the different laws of physics which have been video-taped. Sometimes it's easier to demonstrate things like that in zero gravity environments. Ansari is currently working towards a master's degree in astronomy from Swinburne University (visit: *http://astronomy/swin.edu.au/*).

Image: Space Adventures

Anousheh Ansari preparing for her first space flight.

Does she consider herself a role model for women in general? "I certainly hope to be. In my work and everything that I have done, I have tried to be an example. I hope to inspire everyone – especially young women and girls all over the world, and in Middle Eastern countries that do not provide women with the same opportunities as men – to not give up their dreams and to pursue them," she said.

She doesn't like the term 'space tourist' and calls it an over simplistic label to a complicated process. "In a way I take offence when they call me a tourist because it brings that image of someone with a camera around their neck and a ticket in their hand walking to the airport to go on a trip somewhere and coming back to show their pictures. But I think spaceflight is much more than that."

Source: Space.Com

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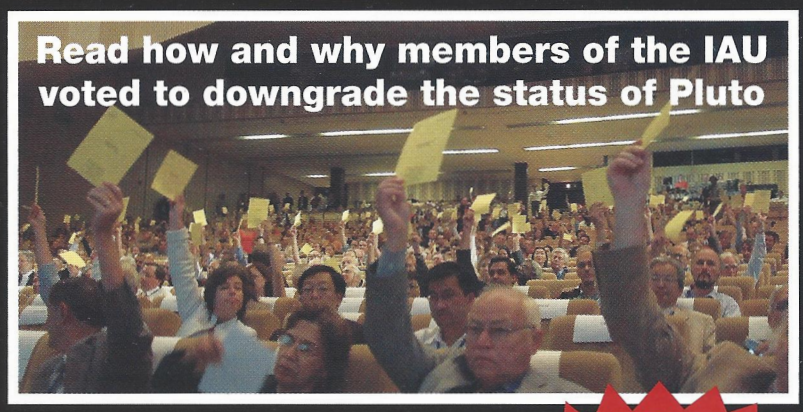

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