

News in brief

HIGH FLYER REWARDED

KADINA student James Francis's passion for aeronautics has been recognised with the University of Adelaide's Andy Thomas scholarship, to assist his aerospace engineering studies.

Mr Francis, 18, pictured, said he had always been inspired by Adelaide astronaut Dr Thomas. "I've always had a passion for aviation so it's great to be able to study a degree (in aerospace) that reflects that interest," the former Kadina Memorial High student said. The scholarship includes tuition fees and some living expenses.



On Friday the University of Adelaide awarded \$1.5 million of scholarships to more than 130 new undergraduates.

Also on Friday, Flinders University presented its inaugural International Student Transition Award to 11 overseas students who last year achieved high grades in their first year at university.

MY SCHOOL V YOUR SCHOOL

OVERALL, the Federal Government's MySchool website appears to have been well received by parents, though it has been forced to defend its use of socio-economic measures to determine which schools are "statistically similar".

This has seen small schools such as Aldgate Primary in the Adelaide Hills compared to Walford and Sydney's prestigious The King's School. Although Aldgate achieved the national average or better in numeracy and literacy, at first glance it seems to have done poorly against "similar" schools nationwide.

The agency behind the website, the Australian Curriculum, Assessment and Reporting Authority, maintained initial problems had affected "less than half of 1 per cent of all (10,000) schools".

WATER TOOLKIT

SCHOOLS now have a "one-stop shop" for material on water sustainability with the launch of an online education resource. The Water Education Toolkit, aimed at teachers, is a hub for resources that can be incorporated into lesson plans. Material and links range from statistics on regional water quality to the life cycle of a dragonfly.

Go to: www.environment.gov.au/wet

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CAN YOU BELIEVE IT?

WITH JONATHAN CARROLL, UNIVERSITY OF ADELAIDE

How beer changed the world of science



DID YOU KNOW

- Only female hop plants produce flowers used for brewing.
- There are now hundreds of strains of yeast used for brewing.
- The outdated German Beer Purity Law of 1516, restricting the ingredients of beer to malted barley, hops and water, was actually used to protect the availability of wheat and rye to bakers, as well as fixing the price of beer.

YOUR SHOUT: Drinkers raise a glass to the humble beer, a much loved beverage around the world.

YOU can get it calculatin'. You can get it demonstratin'. You can get it any old how. Matter o' fact, I've got it now. A hard-earned thirst needs a big cold beer, and the best cold beer has a lot going on behind the bubbles.

As a scientist and a craft-beer brewer, I find it remarkable to see how much science has gone into perfecting a pint of the amber liquid, and how much science has arisen in return. Biology, chemistry and physics come together in fantastically complicated ways to make a beverage loved around the world.

Biology. You might know that a good beer starts out as water, malted barley, hops and yeast, all finely balanced. If you did know that, then you already know more than the brewers before 1860, when Louis Pasteur discovered that yeast is responsible for fermentation.

Yeast is, in fact, single-celled organisms that convert fermentable sugars (in the malted barley) into alcohol, carbon dioxide and various byproducts. The sediment you stir up in a favourite South Australian beer is yeast that has settled out in the bottle where its job was to ferment a small amount of "priming" sugar to carbonate the beer in the bottle.

Chemistry. Do you know the pH of your beer? I bet the brewer who made it does. In

fact, the pH scale was invented by S.P.L. Sorensen at the Carlsberg Laboratory. Small changes in water chemistry can affect the taste and aroma beer, either accentuating the malt, hops or yeast characters.

Some breweries even go so far as to replicate the precise water chemistry of cities traditionally famous for their beers such as Plzen for Pilsners, or Burton-on-Trent for English bitters. The various chemicals found in hops even have pharmaceutical applications.

In fact, originally hops were used for their preserving ability as much as their bittering ability. Hops are also useful as a sleeping aid in hop pillows and as a treatment for anxiety and insomnia when made as a tea.

Finally, physics. Trendy low-carb beers may have slightly fewer kilojoules than regular beers, but did you know that James Prescott Joule (after whom the unit "kilo-joule" is named, also responsible for the First Law of Thermodynamics) was the manager of a brewery in England? His first investigations into electricity were focused on replacing the brewery's steam engines with electric motors.

There's even a little mathematical physics in beer; scientific papers have been written on the exponential decay of beer foam and the way that Guinness bubbles travel down the

sides of a glass. And while on the subject of those bubbles - how do they stay in a beer?

In bottle-conditioned beers, yeast ferments the priming sugar and produces some carbon-dioxide. If the bottle is sealed, pressure builds up under the lid. With nowhere else to go, some of the carbon-dioxide is dissolved back into the liquid and an equilibrium is reached.

When the lid is opened, the external pressure is less and the gas comes out of solution.

If the beer is made correctly, the equilibrium between the gas in the liquid and the amount of carbon dioxide in the air will mean that the gas will only come out of solution slowly.

Tiny imperfections on the surface of a beer glass provide nucleation points where bubbles can form, and the surface tension of the bubbles should create a good foam on the top of the beer.

A tiny amount of detergent or oil on the glass will lower the surface tension and destroy the foam completely.

So, next time you shout a round at the bar, remember how important beer is to the world of science, and raise your glass to Pasteur, Sorensen or Joule.

■ **Dr Jonathan Carroll** is a Post-Doctoral Research Associate in the School of Chemistry & Physics at the University of Adelaide.

Tim to take notes on Reds' travels

TRISTAN WILLES

A SOCCER-LOVING high school student has been granted the chance of a lifetime - to travel overseas with Adelaide United, following their every movement.

Banksia Park International High School student Tim Henderson, 15, will spend a week in Japan with the Reds for their match against Sanfreecce Hiroshima on March 30.

The Year 10 student has won a scholarship with Adelaide United in which he will experience and report on the club's AFC Champions League campaign.

Tim said he was looking forward to spending a week learning how the players live.

"It's going to be a good experience, getting a bit of player insight as to how they live their

life everyday," he said. "I'll see if I can model my life around theirs."

He will report on several aspects of his six-day trip, including Japanese culture, a nutritional and medical component, a logistics and operations component, match training and preparation.

Tim currently plays soccer at a state level and is a member of the under-17 Modbury Jets.

He has also studied Japanese for the past eight years and looks forward to a chance to test his knowledge and immerse himself in Japanese culture.

His physical education teacher and soccer program manager, Paul Jones, will accompany him on his trip.

"Tim was hands-down the best candidate,"

Mr Jones said. "In terms of his ability as a player and really getting something out of the program, he was the best applicant."

The partnership between Banksia Park International High and Adelaide United started in 2008 when the school started running a soccer-focused program.

Mr Jones said the team had run clinics at the school, and students had had the opportunity to go down to watch some training sessions.

"We established pretty close links, and we thought - how can we take that partnership a little bit further?" he said.

"How about we offer a scholarship to one lucky student to go over and experience what goes on?"