

# SPORTY SCIENCE

## Bringing sports into the 21<sup>st</sup> century

Sport is a key area of interest for Australian researchers. Using everything from biology to engineering, Aussie universities, the Australian Institute of Sport, and companies like Nike use STEM principles to bring out the best in our athletes. By optimising strategies, monitoring athlete health and performance, and developing cutting-edge new gear, they bring sports into the future.



At the 2008 Beijing Olympics, Speedo's controversial LZR Elite swimsuit caught public attention for its exceptional performance. Constructed from high-tech fabrics of elastane-nylon and polyurethane, it improved oxygen flow to muscles and optimised hydrodynamics. 94% of Olympic races won at Beijing 2008 were won by athletes wearing the LZR; winning races with science!

Are you an inquisitive and curious sports fan? A career in sport science could be right for you. Check out current sport science research and opportunities:

### Study Advice:

[essa.org.au/essa-me/essa-students-careers-guide/](http://essa.org.au/essa-me/essa-students-careers-guide/)

### Current Research:

[theconversation.com/au/topics/sport-science-227](http://theconversation.com/au/topics/sport-science-227)



#### Image credits:

eightlane.org/sport-science-killed-sport/  
iastate.edu/news/2008/feb/lzrracer.shtml  
howard.offcampuspartners.com

skyandtelescope.com/astronomy-news/a-super-duper-supernova/  
strangehistory.net/2010/08/04/the-battle-of-the-somme-in-london/

# SPORTY SCIENCE

## The power of physics



Today, you've built up the skills to analyse the motion of a complicated system. Did you know the physics of the double bounce happens in supernovae (exploding stars)? The dense inner core gives some of its kinetic energy to lighter gases and plasma, sending them rocketing off just like the high-bounce ball and creating a stunning halo. Similarly, a heavy cricket bat slows down slightly on contact with a light ball, sending it flying off at great velocity. All of these processes can be understood by the same physics of *conservation of energy and momentum* – by understanding one, you can understand them all.

What if we also gave a push as we bounced the ball? This leads to what we know as projectile motion – and the maths is the same whether you push a bouncing ball or shoot a bow at an angle. Projectile motion was used historically to construct artillery tables, enabling the military to aim cannons and mortars before computers were invented. The same mathematics can describe how basketballers pull off layups – contrary to what you might expect, they shoot the ball straight up rather than towards the hoop. Find out why in the article below.



### Galileo Got Game

[wired.com/2014/04/basketball-physics/](http://wired.com/2014/04/basketball-physics/)

### Stacked Ball Drop

[youtu.be/2UHS883\\_P60](https://youtu.be/2UHS883_P60)

### Coursera: Mechanics (from UNSW)

[coursera.org/learn/mechanics-particles-planets](https://coursera.org/learn/mechanics-particles-planets)

**FURTHER  
READING**