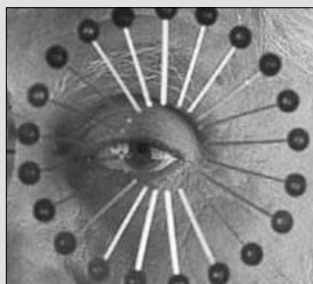


# litmus paper

Issue 4 Saturday 7 June 2003

Edited by Stet Press

## TODAY'S HIGHLIGHTS



Adam Hart-Davis  
12–1 pm/Everyman

Trevor Baylis  
4–5 pm/Everyman

Carl Djerassi  
8.45–10 pm/Everyman

**Programme change**  
Dr John Newton will be  
Safeguarding Genes in place of  
Dr Frances Rawle

## A quantum conundrum

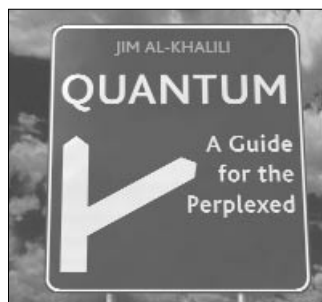
by Dr Andrew Mountford

I never thought I'd hear people laughing in a talk on quantum mechanics, but they did yesterday. Jim Al-Khalili, introduced as "a brave man", began the talk in a somewhat unconventional manner, admitting that firstly he had a "stonking hangover", and secondly that he wasn't actually going to explain quantum mechanics.

However, if my notes are to be believed, that was the whole point of the talk. Quantum mechanics, despite being probably the most successful and important theoretical construct devised by mankind, cannot be understood; at least not in the conventional sense.

Despite the honesty of the opening admissions – and the rather tall order of bringing quantum mechanics to the masses, the talk was extremely entertaining and very well received.

We started with a brief overview of quantum history, from its incep-



*Quantum theory: second on the right and straight on 'til morning.*

tion at the beginning of the 20th Century, explaining heat radiation phenomena, to its status underpinning all significant modern technological achievements, such as your average television or atomic bomb.

We were then taken through the central example of quantum's essential weirdness: the famous two-slit experiment. Where Richard Feynman had used bullets, Al-Khalili used sand. The big idea is that matter produces interference

patterns when passed through two slits on a board. They behave like grains of sand, forming two piles – one behind each slit as you might naively expect. This, it turns out, can only be explained by abandoning the old classical Newtonian view of a "clockwork universe".

Instead, we now have the wave function – a quantity that tells us only what the probability is of a particle being in a particular place at a particular time.

There were more topics – such as the quantum jewel thief (with his Mach-Zender interferometer!), superposition and entanglement, quantum computers, the ever-famous Schrodinger's cat, but all that must wait for another day.

So, did Al-Khalili fail in his attempts to make us not understand the quantum world? Well, I still don't understand quantum mechanics – so as far as I'm concerned, it was a rip-roaring success. Well done that man!

## Leonardo: an enigma wrapped in a scientist

by Laura Churchill

A surprising mix of young and old gathered at the Everyman for "Leonardo" yesterday afternoon. Mike Mosely, executive director of the recent TV series, took the audience on a fast-paced and illuminating journey through the life of Leonardo Da Vinci.

Mosely confessed to having a Leonardo obsession ever since reading Michael White's *First Scientist*. It took him three years to persuade the BBC to produce a documentary examining the life of the man. Surprisingly, Leonardo only painted ten works in his life, but invented "loads" – artillery and flying machines to name but a few.

So was Leonardo Da Vinci a bril-

liant scientist? Mosely tells us that he was not conventional – "scatty" even – but what makes him so fascinating and elusive is that all his notebooks, containing inventions far beyond anything else of the time, were lost and he never actually built any of them.

The talk was interspersed with demonstrations of the various inventions and clips from the series – modern-day teams using some of Leonardo's "scribbles" to create a parachute, a tank and a glider.

Was Leonardo Da Vinci a genius? Well, Mike Mosely certainly thinks so: "I'm a Leonardo nut," he said, although surprisingly few hands went up when he asked who had seen his series.

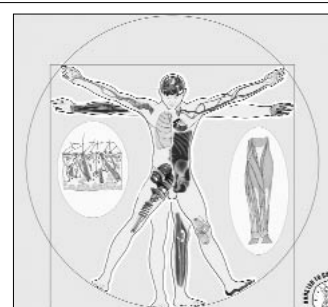
## Man the machine

by Carolyn Allen

"I've learnt to do a rectal exam holding a man's collar", boasted Ian Banks, doctor and author of *Man: Haynes Owners Workshop Manual*, "because men generally run when they hear the sound of a rubber glove." Banks admitted that a rectal exam is not every man's idea of a fun day out, but emphasised that it can prevent serious illness.

He suggested that the macho mentality pervading medical science is one obstacle to successful preventative medicine in men. Many male doctors admit they would rather tell men that a rectal exam is due on their next visit than get it over with there and then – and they wonder why they never see their patients again?

Yet the biggest obstacle to men's health is their pathological avoidance of help. Men have the highest



*A quick oil change for Haynes man.*

mortality rates from cancer because they don't ask for help until it's too late. Banks thinks we should target men differently: "men think mechanically, which is why I wrote the workshop manual – it reads just like the Haynes car manuals."

He also promotes MOT clinics, encouraging men to treat their bodies like their cars and get the basic health checks every year. The clinics are well attended, so maybe they will help get to the bottom of this male health problem.



Kate Humble discovers that reality bites in the rough world of science.

## And here's one we made earlier

by Ruth Warre

Take two scientists (Kathy Sykes and Jonathon Hare) and a TV presenter (Kate Humble) and put them in the harsh and unforgiving environment of the Everyman Theatre.

Give them a picnic hamper full of bits and bobs and ask them to contrive a way to send a message across the auditorium in the next 30 minutes. At the same time, ask them to give an insight into what it's like to make the highly successful TV programme *Rough Science*.

Potentially this could have gone disastrously wrong, but it ended up as a hugely entertaining scientific version of *Blue Peter*.

With help from the audience the trio came up with a system that involved shining a light onto silver foil stretched over a plastic tube. The light reflected from the foil was directed at a solar cell attached to a dismantled radio, which amplified the signal. Speaking into the tube caused the foil to shudder, which vibrated the light, changing the signal and finally allowed the voice to be heard on the radio speaker. This sounds complicated and extremely dubious, but it actually works if you plunge the auditorium into darkness then spend several minutes wandering around trying to get the correct light, angle and position.

We also learnt that Kate Humble was more interested in Ancient Greek than Physics at school and that Mike Leahy (who was unable to attend) spent his time flapping "up and down like a bride's nightie" whilst making *Rough Science*.

# Appliance of slam science

by Adam Horovitz

Science and poetry have a fair history of successful collaboration – Czech poet Miroslav Holub being the finest proponent. But he was a resolutely serious man. How then would the two forms collude in the steely wit arena of a Poetry Slam? On the strength of Slam the Atom, which made a quiet riot of the Pillar Room last night, rather well, thank you.

Poetry slams are always an anarchic smorgasbord of ideas. The poets taking part last night, however, had been issued the challenge of restricting themselves and performing science-specific poems and, to a versifier, they rose to the challenge.



Slam champion AF Harold points out the way to poetic success.

From Helen Gregory's cruel and witty scientific autopsy of the generic love poem to runner-up Rob Evans' coruscating attack on the naming inability of scientists in

what became Schrodinger's poem ("this is a poem/but only when you are not observing it"), this was a night of glorious wit and a little hard science.

Eventual winner AF Harold's speculation that before Newton, no gravity existed amazed and amused in equal measure and Brenda Read-Brown, whose plea for us all to unzip our inner banana received no takers, but should have done, kept the night swinging along nicely.

It must be said that wit and poetry won out over science eventually, but this is often the case, in life as well as slam. What more can you expect when the MC describes himself as "not so much squared as vaguely cuboid"?

## Die hard with a speedy scientist

by Steven Lacey

The Festival tries to solve many everyday problems through the application of science. Yesterday morning, however, saw Jonathan Hare explain the everyday problem of how to break out of a prison with only the shirt on your back and a full bladder.

With Robert Llewellyn, Jonathan fronts the BBC series *Hollywood*

*Science*, and yesterday at the Everyman he recreated some of the more scientifically dubious moments from famous action films, attempting to prove whether or not they could actually occur.

An eager audience of school-children lapped it all up, from acid lakes to Evel-Knievel-style stunts in a bus – even taking in the complicated mathematics involved when deducing what would have really happened to Bruce Willis in *Die Hard* when he jumped of the Nakatomi Plaza attached to a fire hose. It turns out he would have

broken most of his bones, ruptured his liver and spleen, and died within twenty minutes.

Jonathan pointed out how difficult it would be to recreate a black hole in his garden shed, and this low-tech approach reached its peak when a toy bus and two video cases were used to represent the infamous jump in *Speed*.

At the end of the day, it is pleasing to know that Hollywood can get it wrong occasionally, and that the bus would have broken its axles, dropped below 50, and been blown to smithereens.



**ATTACK OF THE KILLER GOO:** Everyone was getting their hands dirty in the Discovery Zone yesterday as a simple mixture of cornflour and water turned grown adults into giggling kids. It works like this: you squeeze the mixture into a hard ball and then, as you let go it transforms into a cold shimmering slimy goo, slipping away between sticky fingers – very strange. RC

## THE DROID

Promising to reveal the secrets of the Universe, the Space Sleeper was thrown by a group of quizzical five year olds yesterday. "Who made God?" and "Is there life on Mars?" they asked, leaving the Space Sleeper wishing he'd stayed in bed.

●  
Lost pets corner: Missing cat, breed unknown, colour unknown, markings unknown, existence unknown. Please contact Mr Schrodinger...