Hi this is Steve Nerlich from Cheap Astronomy, with a little help from a friend, www.cheapastro.com and this *Watch this space.*

(Click) Hello, this is Eran Segev, President of the Australian Skeptics and Skeptic Zone podcaster. Please leave a message after the beep. Thank you.
(Beep) Hi Eran, ah Steve Nerlich here. Hey, I've been listening to some of your material on the 365 days of astronomy and love your work, thought maybe we could do lunch and, you know, work up an episode? I'm thinking something skeptical…with astronomy in it. Hope to hear from you (Click).

(Click) This is Steve Nerlich of the surprisingly inexpensive Cheap Astronomy podcasts. It'll beep - leave message.
(Beep) Hi Steve – Eran Segev here, returning your call. Hey, great idea about the podcast. You might be aware that I am very interested in application of the scientific method as the best way to gain an insight into what is truth.

In astronomy you have people like Aristarchus at around 200BC suggesting the Earth and the planets revolved around the Sun, based on his own observations. But his ideas where largely ignored in favour of geocentric models proposed by Aristotle and later Ptolemy. They were very smart men in their way, but favoured developing mathematical and philosophical models to fit theories that seemed intrinsically logical and consistent with a prevailing world view – rather than collecting data on real phenomena that would test the validity of those theories.

It took another 1800 years until people like Copernicus, Kepler and Galileo came along and looked at detailed data collected by Tycho Brahe as well as Galileo himself. It was clear that the data didn't fit the Ptolomeic geocentric theory, but it did fit the Copernican heliocentric theory.

So how's that Steve, maybe we could work something up around these ideas? (Click).

Hello, this is Eran Segev. Please leave a message after the beep. Thank you. (Beep) Hey Eran – thanks for your message. Brilliant! We could also bring that whole story into the twentieth century by which time lots of people are pointing quite sophisticated telescopes into the sky and collecting lots of data which continues to fit Kepler's laws of planetary motion and Newton's theory of gravity – except for this funny little anomaly with the orbit of Mercury. Then Einstein comes along in 1915 with general relativity, a completely new theory of gravity. Not only does his theory explain the precession of Mercury's orbit – it also explains the orbits of the other planets - just as well as Newton's theory did.

So look, this is all great for an opening – but shouldn't we be doing something skeptical? (Click).

This is Steve Nerlich. It'll beep – leave message. (Beep) Well Steve, I would argue that this is what skepticism is all about. If only people had applied critical thinking to the Ptolemaic geocentric world view – by collecting observational data that might either support or debunk it – they could have easily seen it just wasn't right and it would not have taken 1800 years to regain the observation-based heliocentric model that Aristarchus had first proposed.

But maybe I should put this back on to you Steve – are their issues in 21st century astronomy that you think we should be skeptical about? (Click).

(Beep) Hi Eran – well… I don't find things like Doomsday 2012, alien abductions or moon landing hoaxes all that interesting – and I think many better people than I have done a fine job debunking these things.

I'd say I am skeptical about the value of filling gaps in our knowledge with untestable ideas. I can see some value in bouncing ideas around, but in the absence of data maybe there's some danger of repeating the mistakes of Aristotle and Ptolemy who just built ideas on ideas without ever doing a reality check against what happens in the real world.

I mean, it's clear that we live in a universe - and an expanding one at that - and OK *maybe* our universe resides in a wormhole connecting two black holes from two alternate universes. But there's at least an equal likelihood it just popped into existence out of nothing, which is a remarkable enough thing in itself. I don't know why people get drawn to these weird, complex and largely untestable theories when more conventional and well established science might explain things just as well – even if it still delivers an incomplete explanation (Click).

(Beep) It sounds like you would get on well with William of Ockham who said 'entities must not be multiplied beyond necessity' or even Isaac Newton who said 'We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances."

I think that what you are saying about those cosmology theories is that there is limited value in replacing one theory, which already has many unanswered questions, with another more complicated theory, which raises even more questions and brings us no closer to explaining the observational data we have at our disposal. It seems like a good example of applying Ockham's razor to a problem – which is a key component of a skeptic's toolkit… or is that utility belt?

But remember your example of Albert Einstein. I think he did largely build his relativity theories as pure theory based on mathematics. Even the experiments he conducted were thought experiments, right there in his mind. It was only after he formulated the theory that it was tested against observational data and found to be valid (Click).

(Beep) Oh yeah… good point (Click).

(Beep) So neither Ockham's razor and critical thinking, nor skepticism generally, are meant to quash new ideas or discourage debate. Quite the contrary. The tools are just there to encourage people to test the strength of new ideas for themselves by looking at the evidence underpinning them – otherwise they are just, you know, ideas (Click).

(Beep) Thanks Eran – hey, you know, I reckon that might just fill out ten minutes. Except…have you got any ideas for the end bit? You know, I usually say *Thanks for listening. This is Steve Nerlich from Cheap Astronomy, www.cheapastro.com.* And then I go

Cheap Astronomy offers an educational website and some hilariously funny bit goes here before I end with *No ads, no profit, just good science.* So… any ideas? (Click).

(Beep) How about this Steve? *Cheap Astronomy offers an educational website with things that make you go hmmm*. Like it? It gives you the skeptical angle, but in a light-hearted way.

Anyway, Steve I'm looking forward to that lunch so that we can put all this together. See you soon (Click).

(Beep) Oh, ah… lunch, yeah. Hey look, are sandwiches OK? I do this great thing with cheese and vegemite. (Click).

(Beep) Ah, hi Eran - haven't heard from you for a while… Eran?

(ends)