

Episode 30: Visiting an Old Friend For the First Time

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Travis: Welcome to Slacker Astronomy; a podcast about astronomy and just about anything else that floats over our heads.

Pamela: Each week we bring you a recent news event in the world of astronomy. And when there is no news, we continue our attempt to fuse the DNA of Carl Sagan, Bill Clinton and Brad Pitt to create the world's most irresistible astronomer.

Travis: By the way, if anyone has an empty Swiss bank accounts which they'd let us use, let us know. We only need them for a few hours.

Pamela: If we move fast enough we can compact lots of time just a few hours.

Travis: Huh?

Pamela: It's all just relative. Go listen to our interview with Andy Fraknoi on the SA Extra channel times inconstant nature will all make sense. In this and many of the stories we cover in astronomy we talk about the past. After all, when we look through space we are seeing the Universe as it was, not as it is.

Travis: But this week we are going to talk about the future. In particular, about ten and a half years from now. If Murphy's Law will hold its breath for a bit and a certain star in the sky is quite literally aligned in the right spot, then Mankind's first robotic visit to Pluto will be arriving almost exactly 15 years from now.

Pamela: The New Horizons mission is a NASA funded attempt to send a probe to Pluto and the Kuiper Belt.

Travis: Pluto being the second largest Kuiper Belt Object or the Smallest Planet, or Both.

Pamela: The spacecraft was delivered this week to Kennedy Space Center in Florida in preparation for a launch this January.

Travis: Pluto is the only planet in our solar system never visited by a probe from Earth (excluding the newly discovered 10th planet of course). It's hard to believe with all of our rovers leaving little tracks all over Mars, our landings on far away bodies like Titan and the asteroid Eros and of course human footprints and golfballs on the Moon, that we've never so much as sent a small little camera to Pluto.

Pamela: One reason is Pluto is just so far away. It takes decades to get there and it is difficult to fund a mission that has a payoff so far in the future.

Travis: And, curiously enough, mission opponents who consistently kill mission proposals use the same reasoning that makes Pluto such an attractive target for scientists. That reason? We just don't know much about the outer frozen parts of the Solar System.

Pamela: Is Pluto a boring rocky world? Is it yet one of many such bodies? Frankly, is it worth it? Those are questions that were raised enough to cancel four different Pluto missions proposed in the last 20 years.

Travis: Pluto itself has trouble getting some respect, with all these folks trying to demote it from being a planet. It was sad seeing even missions to the place being laughed at.

Pamela: That would all of course change if we had pretty images of Pluto. But unfortunately all we have are blurry dots. It's hard to get excited about fuzzy specs. If Pluto's treatment is any indication, then the new 10th planet, even further away and fainter than Pluto, is going to have a real tough time gaining respect. Slacker Astronomy proposes to name the 10th planet Dangerfield. (rodney dangerfield sample?)

Travis: Dangerfield. That's perfect. A reference to a comedic legend for us old farts, and a nice strong verb of excitement for the young 'uns who don't remember him.

Pamela: Hopefully this sad state of affairs will begin to change for Pluto in about ten years when New Horizons starts sending back photographs of Pluto and its large moon Charon.

Travis: The photographs should be good enough to see objects and features as small as 1.6 kilometers in size. Along with four other instruments, about 8 gigabytes of data are expected to be collected as the probe passes by.

Pamela: This should be enough for a few calendars and photo spreads in Playspace magazines.

Travis: Pluto won't be completely exposed, so it will be more like MaximSpace magazine. New Horizons will be flying by Pluto at 11 kilometers per second, way too fast to be captured by Pluto's feeble gravity, allowing it to take orbital snap shots.

Pamela: And even though Pluto will be rotating, parts of it will never be in view of the spacecraft. So some mystery will remain. Besides, if any of our probes have taught us a thing, it's that they tease us with yet more mysteries than anything else.

Travis: The New Horizons mission is scheduled for launch on January 11, 2006. It could of course be postponed by poor weather or rocket trouble If it is launched by February 3 then it will slingshot around Jupiter to arrive at Pluto in 2015.

Pamela: If it misses those dates, then it can also launch February 3 to the 14th.

Travis: If it misses those dates, then it has to wait until January of next year. But it can only get a boost from Jupiter if it goes before February 3, 2006.

Pamela: We alluded to the reason in our last show. Jupiter has to be aligned with Earth and Pluto in just such a way in order for New Horizons to get there by 2015.

Travis: Sounds like astrology leaking into the show.

Pamela: No way. If it were we'd be ten times as popular and rich. Tempting as it may be, I just couldn't do it. Although (thinking).. hmm, slacker astrology does have a certain ring to it...

(short music fade in)

Travis: Welcome to another edition of slacker astrology, where each week we bring you a prediction from the world of astrology. And if there is nothing to predict, well that must mean tomorrow is the end of the world so we'll pack up and go home.

Pamela: This week we will be focused on taurus the bull. Researchers have discovered that when taurus is aligned with Jupiter, which is then aligned with the McDonald's sign on Route 20, then we recommend that you do NOT try the special sauce. A bad evening will ensue.

Travis: For the Scorpios out there, we predict a very busy day with some ups and downs. But at the end of the day you will be very tired. We see a dark room, something round and soft, and a slow, rhythmic breathing sound. Beware of falling into a temporary coma that lasts, perhaps 6-8 hours. You will wake up feeling groggy, with a bad taste in your mouth, and you will have memories of hallucinations. Often they will involve flying, falling, or being late for a test.

(music fade out... - feel free to switch order below if you want)

Travis: On second thought, let's not quit our day job.

Pamela: And give up sacking groceries? Never!

Travis: And I am quite fond of my nights in the strip club too. You should see the pole dance I do with the telescope. Instead of dollar bills, they put eyepieces in my shorts.

Pamela: That must hurt.

Travis: It beats the abascusses I got when I worked near MIT.

Pamela: They have strip clubs near MIT?

Travis: We used too, but their glasses kept fogging up so we went out of business.

Pamela: You'd think MIT kids could come up with an invention for that.

Travis: Oh they did, but I won't even tell you the laws it violated, both state and federal. I think it even violated a physical law or two.

Pamela: Wow, those MIT kids can really get into it.

Travis: Their safety word was excelsior.

Pamela: Um, maybe we should get back to the show...

Travis: So if New Horizons is able to use Jupiter to slingshot to Pluto it will provide a double whammy of science. First, as it passes Jupiter it will be able to study it closely and provide another epoch of data following the demise of the Galileo spacecraft in September, 2003.

Pamela: Also, the speed it picks up from the gravitational assist will get it to Pluto 2-3 years earlier than if it needs to take a direct approach.

Travis: Finally, all this speed will save some of the precious Hydrazine fuel on board. This is the fuel used for its onboard engines. It is used to make minor course adjustments. The more fuel that is saved now, the more it will have for its post-Pluto mission.

Pamela: Once the spacecraft passes by Pluto and Charon, it will head out into the Kuiper belt. Currently, astronomers are surveying the belt looking for objects they could target for a visit. The more fuel the spacecraft has left over, the more freedom the mission planners will have to change course and visit a new object. The big fear is that there would be too little fuel left and no Kuiper belt object in range.

Travis: But this is not a Kuiper Belt mission, it is a Pluto mission. So nothing will be risked to get to a Kuiper belt object that isn't also named Pluto. Pluto is target numero uno. Anything else is gravy.

Pamela: The spacecraft itself is being powered by a radioisotope thermal generator, or RTG. Heat from the decay of Plutonium will generate about 190 watts of power when it reaches Pluto. That is a good 15 watts of more power than they need to power all systems so there is a good safety margin built in.

Travis: The fuel should last to around 2025 according to current estimates, which would put the spacecraft around 50-60 AU's from the Sun. Or about as far as you have to park when visiting Disney World after 10am.

Pamela: One reason the mission has been delayed so much is the security scandals at Las Alamos Laboratories a few years ago. Shipments of plutonium were suspended until they figured out the problem.

Travis: Which turned out to be a simple inventory problem. Or so they say.

Pamela: Instrument data will be transmitted from New Horizons to the NASA Deep Space Network at a whopping 768 bytes per second. So it will take a while to get all the data. But time is one thing that this mission has plenty of.

Travis: Actual testing of the equipment on the ground reveals a data throughput of around 2 times better than that. This is an interesting benefit of high-risk space missions. Because so much can go wrong, engineers design equipment to perform much better than needed. That way if something goes wrong they are more likely to at least reach their minimal science goals.

Pamela: The upside is when things work smoothly, missions can last much longer than predicted. Two glorious examples of that are the Galileo mission to Jupiter and the current Mars rovers, all of which lasted far longer than even the most optimistic Las Vegas oddsmakers would gamble on.

Travis: The New Horizons mission is budgeted at about 600 million dollars. So it ain't child's play. Much is at stake. Pluto is moving away from the Earth, making future missions even more difficult and expensive.

Pamela: It's orbit is eccentric, more like an oval than a circle. And as it is moving out away from the Sun so it is getting farther and farther and cooler and cooler. Any atmosphere it may have will probably freeze out and be undetectable by future missions. It is important to get there now.

Travis: Now being in 2015 or so.

Pamela: Which in astronomy is pretty darn soon.

Travis: But right now, by my watch, it's time to wrap up this show. Thanks for listening to another episode of Slacker Astrology, I mean, Slacker Astronomy.

Pamela: We have put lots of new shows on our SA Extra feed in the last few weeks including some chit chat shows, sound seeing tours and interviews. Sign up for that bonus feed at slackerastronomy.org.

Travis: And don't forget you can post comments and chat with fellow listeners on our web site too.

Pamela: Also, we have joined forces with other organizations to raise funds for educational institutions that lost equipment during the Katrina hurricane disaster. You can now make donations online with credit cards. Visit slackerastronomy.org for more info on how you can donate and where the funds will go.

Travis: Again, thanks for listening. For Pamela Gay and our author Aaron Price, I'm Travis Searle.

Pamela: You have been listening to slacker astronomy, a podcast for you, for fun, for the voices in our heads.