

Chapter 1 : Part 3 – Grey Tree Moon - Gamer Walkthroughs

Looking at the problem of life moving between the planetary bodies, including the distances and time involved and how humans may be unintentionally spreading.

The Tense and Complex Astrological Situation of the Late Century The previous section touched on the main challenges and opportunities posed by the current Neptune-Pluto cycle, and outlined some of the important social and intellectual transformations which took place around the last conjunction of the two planets in 1912. The Great War, as World War I was known in its time, occurred during the waxing semisextile phase 30 degrees of our current Neptune-Pluto cycle. The war shocked Europe and the world with the realization that modern humanity had not yet outgrown its barbaric past. Yet its peace brought for a few short years a vision of what could be. The inertia of the past cycle and the unsolved problems acting through WWI challenged the expanding creative impulse of the new cycle during the tense and confrontive semisquare phase 45 degrees of Neptune and Pluto, which lasted from the late 1910s to the mid-1920s. It saw a flourish of new ideas and attitudes in all fields of human endeavor vanquished by the Great Depression, and the rise of Fascism and its corollary in the arts and sciences, "neo-Classicism. Septile aspects represent the compulsive and irrational elements of existence, and its arc of 90 degrees. They also symbolize the action of fate or destiny. A waxing septile, which occurs after the opening of a new cycle of relationship, represents the action of karma and the enduring pressure of ancient patterns. During such a phase we are faced with the challenge to neutralize the failures and unfinished business of the past cycle, which can return to haunt the present. Destiny and fate are related, yet polar opposites. Destiny provides the experiences and conditions through which we may realize and fulfill what we were born for, our dharma or truth of being. Humanity today needs to take a step into the next phase of its evolution and to realize a new, harmonious form of global social organization. If the challenge is accepted, destiny opens the way. Each of us have a function to fulfill in making a truly new age a reality, and if we accept that function—which one must recognize for oneself—destiny provides the conditions allowing its fulfillment within the range made possible by collective factors, by the success or failure of humanity as a whole. The existence of the year cycle of Neptune and Pluto was unknown before the discovery of the planet Pluto in 1930. Its discovery marked the first widespread development of new human capacities, and gave new potency to the before then unknown Neptune-Pluto cycle. New human faculties and capacities always seem to be misused at first, and the early phases of the current Neptune-Pluto cycle produced ample exemplars of such misuse and showed the world the fate awaiting personages and movements resisting the direction of human and planetary evolution. Out of the confrontive semisquare and fateful septile phases, which witnessed the darkest and most terrifying years of this or any century, grew the hopefully constructive years of the sextile phase—the mid-1920s to mid-1930s. The "long sextile" of Pluto and Neptune is perhaps the most optimistic factor of our complex celestial and mundane situation. It may be significant that its approximately year length is about that of a long and full human lifetime. It began in the mid-1920s—the birth years of many counterculture and new age forerunners. It is a fitting signature of a generation. But like Moses who was forbidden to enter the Promised Land, those born in the 1920s may complete their life-cycles soon before the concrete and existential beginning of the Aquarian Age, expected to occur around 1980. Rudhyar writes in *Astrological Timing*, that the so-called "long sextile" constitutes, as it were, the deep bass-note supporting the chord of faster shifting planetary relationships. As the sextile is a constructive and steadying aspect, this "long-sextile" of Neptune and Pluto. A Prelude to Global Transformation The mid-1930s saw still immature, underground stirrings of the seed-message sown at the Neptune-Pluto conjunction of 1912. Two factors figure largely in the celestial situation of the 1930s. The first is the Uranus-Pluto conjunction of 1936. Saturn in opposition to these conjunctions signifies a polarized situation between a Saturnian establishment and a variety of discontent elements seeking integration or revolution. The mid-1930s signaled the rapid, worldwide spread of peace and civil rights demonstrations, large-scale youth protest, the use of psychedelics drugs and, eventually, social and ideological change. The mind-transforming influences of the Uranus-Pluto conjunctions of 1912 and 1936 forced us to realize we are living amid a situation demanding a very deep and thorough change of mind. Any deep and essential change, however, takes

time and involves repetition of its keynote on various levels. The powerful, revolutionary Uranus-Pluto conjunction was followed in by a waning sextile between Uranus and Neptune. A fall epitomized by the police assault on demonstrators gathered in Chicago during the Democratic National Convention. The incident and its epilogue—a highly publicized and controversial trial—resulted in a temporary backlash of public opinion against the Establishment. It culminated in the Watergate incident and the resignation of President Nixon. The counterculture of the s survived and the s witnessed widespread social and ideological change—change in many ways reversed during the s. The transition from virgin to lover occurs in a night and, transforming the past, gives rise to new possibilities. The tidal wave of social, political and ideological change in Eastern Europe and Russia also occurred around: Hours after it occurred the United States and its allies began bombing Bagdad. In Search of a New Principle of Integration During the lates and earlys, five basic, sometimes overlapping, social-political trends seem to be operative. Many Islamic and former southern Soviet republics may be gradually following this trend—in their own way. If integration is founded on exclusionary platforms grounded in region and religion, however, the movement toward unification is severely limited and eventually produces just another big nation competing with other big nations. The second trend disintegrates monolithic social and political "blocks" mortared together by an often brutally enforced ideology. Although on the surface this movement may appear to be moving toward small, independent and utterly sovereign political entities concerned only with their own welfare, prosperity and ethnic integrity, it may be the first stage of a voluntary and purposeful reintegration in which each "unit" participates freely in the realization of a new sense of togetherness and unanimity. In other words, both individuals and collectives must first feel themselves free and independent wholes before they can a meaningfully identify with and creatively participate in a large whole. The trend may also feature the resumption of old conflicts and vendettas, as seen today in Bosnia. In its larger sense, it is a deconditioning process leading to reintegration. The third trend is characterized by nations, classes, social and religious groups, as well as by alienated individuals, unable or unwilling to participate in any larger whole in which they cannot play the role of master. In terms of nations, the collective mentality is locked in a hypnotic stranglehold by the belief that it must compete against all other nations; or that its particular ideology and way of life represents the One and Only True Way; or that it is somehow uniquely qualified to rule or police the world. This is the path of a dying and fearful culture that has lost the ability to visualize a creative future. It replaces vitality and creativity lost with rigid and controlling structures propping up its slowly collapsing institutions and way of life. It is the way of fascism. A nation following this trend may long for a return to its "Glory Days," a return to a post-war boom when money was plentiful and the future always looked bright, for the "good old days" when its society and culture were still "pure," unpolluted by centrifugal elements, such as "the Jewish" or "illegal immigrants. It wants to hold supremacy over other nations. The fourth trend is characterized by a national desire of Third World nations to emulate in their own way the middle-class life styles they imagine are being lived by citizens of the United States and Europe. Nations that were once colonies of Europe or de facto American colonies have been gradually pursuing this path of emulation for centuries, often under subtle and not so subtle coercion. The citizens of these nations are becoming rapidly inflected with an avarice for expensive imported items—cars and motorscooters, TVs and VCRs, modern kitchens and high technology. Although these nations emulate, they need to regenerate. In the event of a major, worldwide technological setback, however, these nations may fare far better than nations following the third course. The fifth trend may be seen in an as yet ill-defined movement toward recognizing the necessity of a global society and facilitating its gradual realization. Members of all nations are tuning into and resonating with the creative tone and power underlying the movement, yet it is difficult to identify groups and nations truly exemplary of it. In the European community, perhaps Holland and Denmark come nearest, with Britain occupying the opposite pole. The fifth trend differs from the first to the degree it features a conscious drive toward a harmonious and all-inclusive global society. They march through the zodiac in steps of sixteen degrees. Uranus and Neptune last met during in the early degrees of Capricorn, and before that during in mid-Sagittarius. The conjunction of coincided with the rise of empirical science and the large-scale colonization of North America. The period between to saw the breakdown of the Classical Era and the birth of the Revolutionary Age. The closing cycle of to featured the growing power of individualism, capitalism and

imperialism. During this phase humanity experienced two devastating world wars, a worldwide economic depression and the rise and fall of Fascism, Nazism and Communism. Due to scientific and technological advances made during the last two Uranus-Neptune cycles, a global society is now not only possible but necessary. It is necessary because the sort of power modern science and technology has placed at the disposal of as yet morally and spiritually undeveloped men have produced global problems. For instance, the very existence and proliferation of plutonium is not merely a local or national concern—it poses global problems which must be dealt with on a global level. Local mindedness and local solutions are no longer adequate—instead of solving problems they compound them. In a sense this is so because much of our current science and technology, and especially our present-day scientific and technological mindsets, are still rooted in a classical past. At best they seem tied to Neptune-Pluto cycle of . It was during that cycle that our current science and technology, as well as the political-military-industrial complex, were conceived. They sounded a call to active transformation, a call to attune to and actualize the seed-message of this Neptune-Pluto cycle. The challenge posed by the Uranus-Neptune conjunction of is clear and simple: Take a step beyond national sovereignty and cultural pride—transform or perish. Everywhere the signs of the times seem to echo the message: Take the next evolutionary step ahead become a mutant seed, an agent of transformation or perish be a leaf, among innumerable other leaves on the autumnal forest floor, that eventually disintegrates into humus. Yet it takes time for the seed to germinate, and it will take time for the message sounded by the Uranus-Neptune conjunction to be heard. Meaning and significance actually lie not so much in events but in our response to them. It may well be too late to avoid a more or less drastic and, from the point of view of obsolescent institutions and mindsets, destructive adjustments. Doing and giving too little too late, humanity may be forcing or polarizing an intervention of the Earth-being—our Greater Whole. Global famine, depletion of the ozone, telluric activity, drastically altered weather, pole shift, plague and any one of innumerable other cataclysms may be interpreted as Wholeness acting to dissolve the leaves of a closing cycle. But at least some seeds survive even the harshest winter. European integration, however, is not a new idea. During the last Uranus-Neptune conjunction, which occurred in , the Saint-Simonians were busy formulating and promoting a plan for European unification. Do the European people and collectives sincerely wish eventually to united with all nations and peoples in a global society of harmony and fullness, or is the drive toward unification actually self-serving—a means to better compete against Japan, the United States and the rest of the world? And what of Eastern Europe and Eastern Europeans? The first Democrat to occupy the White House since , and the first youthful president since John Kennedy in the s, Clinton seemed a well-suited agent of trans-Saturnian forces. Yet the reforms proposed by his administration have met unprecedented resistance in the legislature. At the end of his second year in office, however, the GATT agreement bringing the United States into the global marketplace passed with an overwhelming majority. Yet it may cast a long shadow. In Russia, a few days after the conjunction, Yeltsin successfully defeated hardline opposition. And on 12 February a historical pact was signed promising the end of white rule in South Africa by April

ROOT CHAKRA: It is the first chakra (known as Base Chakra or Root), is located at the base of the spine. It relates to the creator of the sexual energy power.

Back to Samorost 3 Walkthrough Land on the planet and get out of your spaceship. Walk to the west and sit on one of the cushions in front of the man in the tent. Stand up and zoom out until you can see all of the trees. Pull the green bulb up until the parrots get interested. They will slowly hop towards it and begin fighting over it. The parrots will break the bulb off and it will drop to the ground. Go and pick it up. Walk to the east twice and use the trumpet on the hole in the tree branch that is sticking up. Walk further to the east to the end of this tree planet. Termites are walking out of their holes and back again. Start clicking on the termites until they start to sing. When a number of them sing in unison a large termite will appear. This is the beginning of another puzzle. Click on the symbol that appears in the sky after the termite flies away. Pull the jaw down of the branch at the top and climb down it like a ladder. Climb in the large hole to the left of the screen. Walk out of the hole and then along the log to the east. Continue walking to the east and then turn back to enter the large hole slightly below the path you were walking. In the central chamber are four lights dangling down. From left to right if you pull the fourth one the termite will lay an egg that you can pick up. There are three tunnels you can place the egg into. Pulling the other three lights will change the path that the egg will follow. You want to drop an egg into all three baby termite rooms at the bottom. Pull the third light and then drop an egg in the third hole. This will drop an egg to the first termite next to the pile of eggs. It will create a symbol. Click on it to continue. Pull the first light and the third light until the switch underneath stands straight up. Pull the fourth for an egg and then drop it into the first hole. This will feed the second termite. You can now walk to the right and down the tunnel which will take you to the west. Keep walking to the west until you enter a cave with rocks. A fly is trapped inside here. Keep pulling the rocks until the path to the west is clear and the fly escapes. Go back to the central chamber and pull the fourth light for another egg. Pull the second light and then drop the egg into the second hole. This will feed the third baby termite. Click on the container to be spat out and continue your journey downwards. There are a lot of little creatures here that you can click on for some funny noises. Pull up the suction cup at the end of the branch and let it go so it flings back and gets stuck on the little creature. Click on the bee hive and a bee will come out to pollinate the flowers. Click on one of the flowers and then the other. The bee will follow the pollen and some kind of yellow fruit will appear. The bird may eat the fruit the first time you do it. Walk up the two ladders to the top. Follow the path behind the tree and follow the highest branch at the back to the left. Climb up it back to the man sitting under the tent. Head back to your ship to the east. Click on the bee hive and then click on first one flower and then the other. The bee will follow the pollen and cross-pollinate the flowers producing a fruit like an apple. You should have three fruits now. Place the yellow banana-like fruit in the hole just above and to the left of the first red flower. Place the green fruit in the hole just below and to the left of the yellow fruit. Place the red fruit to the right of the red flower. All of the fruits will produce little plants. Click on the bee hive again and then click the white flower followed by the red flower. This will produce a fruit that is a mix between the two plants. Grab it and plant it again. Keep going until the plants produce what looks like a little mandrake root creature. Go back to the man under the tent and give him the mandrake root creature. Use the trumpet on the tea kettle. The man will pour you some tea and show you how to get rid of the vine that is trapping your spaceship. Take the cup of tea. Click on the green parrot above the tent until it poops on the tent. When the man stands up to clean it off jump over to the right and smoke the pipe. Click on the symbol and walk back to your spaceship. Use the tea on the vine. You can now hop back into your ship and take off. Click on the orange planet to fly towards it. Continue with Part 4:

Chapter 3 : The Planets – Going Postal

Conjunctions are the most striking aspect between any two planets, in part because both planets generally fall into one sign and house—creating a powerful impact on the matters of that house. In doing charts of youngsters born with Uranus and Neptune conjunct, the conjunction's house position is crucial in understanding where the.

Part 3 of 12 All horoscopes have three main components: What follows is a brief overview of the planets and what they represent. Of course, the Sun and Moon are not really planetary bodies, but, for ease, are often referred to as such. Each planet represents a function in the human personality or psyche, and are grouped into two categories: The term "outer planets" is more often applied to Uranus, Neptune, and Pluto, whereas Jupiter and Saturn are considered the "social" planets. The personal planets move more quickly through the zodiac, accounting for significant differences between the horoscopes of individuals born only days apart. For example, the Moon moves through all 12 signs in less than 29 days, and Mars will travel through the entire 12 signs in 2 years. In contrast, the outer planets take much longer to move through the signs. Jupiter takes a year to move through one sign, and the outer planets take considerably longer. Because of their slow movement, the outer planets have more of a generational influence. Everyone has a Mercury – we all possess the part of the psyche it symbolizes. But not everyone has Mercury in Taurus in the 4th house. Once you are familiar with the functions of each planet, you can then discover how those functions express themselves sign placement and in what area of life they are most likely to manifest house placement. Keep in mind that the following definitions are very brief and generalized. As with any area of astrology, there are many other layers of interpretation and meaning that are useful, valid, and important. The Sun in the horoscope represents the basic identity, the life purpose and the will to exist. Just as the movements of the planets reflect human affairs, the planets in the horoscope are also reflections of specific parts of the Solar purpose. An individual with Sun in Leo, for example, may have full creative self-expression as his or her life purpose, and this purpose will be further described and modified by both the placements of the other planets and their angular relationships, or aspects, to the Sun. The Moon, which reflects the light of the Sun, is our personal reservoir or container of life experiences, the colored glasses through which we perceive our world. It is a way of being and of relating to life that feels more natural and comfortable. Although the Moon does not represent emotions per se, it is connected with the emotions and with memory to the extent that we ascribe emotions to our experiences. To put it another way, the Moon is like a photo album containing the many pictures of our lives. When we look at these pictures, they evoke certain feeling states and emotions. Someone with Moon in Pisces may experience their world in a highly imaginative way, while a Capricorn Moon may relate to their environment in a more rational, objective manner. Mercury relates to the principle of intellect and the ability of an individual to perceive and relate to other individuals or objects as different from themselves. It is therefore connected to communication, language, and symbol. Unlike the Moon, which assigns emotion to experience, Mercury is neutral, acting only to bridge the space between the individual and other beings. It generally imparts information about what a person grooves on. It symbolizes assertion, action, and the focused use of will, and is associated with the survival instinct. More negatively, it can manifest as unnecessary aggression and willfulness. Jupiter symbolizes the principle of expansion and growth and describes how the individual integrates him- or herself into society and personal environment. It also represents the desire to grow, to learn and to incorporate new information and experience. Its position shows the area of life where we may positively benefit from our inherent qualities and talents, and, perhaps more importantly, from our ability to recognize opportunities as they become available. Saturn indicates the principles of form, disciplined action, and gradual development. These limitations can loom as serious obstacles, and a person will often feel fearful and inadequate in the areas of life that Saturn affects in the birth chart. The goal is to develop confidence and stability where necessary. The function of Uranus is a metaphoric awakening of the individual through a psychological breakthrough, an unexpected event, or a departure from old forms. It represents conscious shock, the ability of the individual to break through to new levels or realms of understanding or consciousness. Finally, Pluto acts by completely overhauling a form – a part of the psyche or an area of life – by

destroying it and then recreating it. It signifies the area of life where a person will undergo deep, transformative change. As previously mentioned, Uranus, Neptune, and Pluto move very slowly, staying in the same sign for years. For this reason, their effects are not felt as personally, but tend to impact on a generational level. Joan McEvers, editor, *Planets: The Astrological Tools*; Llewellyn Publications.

Chapter 4 : The Privileged Planet Part 3: The Anthropic principle

PART THREE Jupiter and Saturn. With these two planets we reach the realm of social activity and of the "social sense" in individual human beings. The spontaneous self.

Needless to say, after all these weeks of scrounging for beef jerky, crafting boots out of harvested deer, and battling wolves, my survival game kung fu is strong! But you get the idea guys. Oh, and check out this sweet map that Marc is contributing to the game! On to the journal entries Day 3 Running low on food and water the party tries searching the cairn for a source of water. Floyd Pink finds the lowest point in the room, and attempts to pry up one of the stones in the wall. To free Floyd Pink, Imric casts enlarge on Hammy, who in turn lifts the stone. Once it was night the party set out into the wild, again hoping to avoid the weirdling sun. They wanted to make their way to the lake to the south, hoping to find cool, sustaining water and maybe some more insight into this strange world. After a few hours they heard horrible grunts and flapping in the hills to the west. The shadowy shapes of nine lizard creatures flying in the night startled The Free Company, causing them to draw their weapons. These beasts, called Gribbs, set upon the travelers with razor sharp talons. During the battle with the gribbs, Floyd Pink almost killed himself by fumbling with his ray rifle. He was pointing it backwards when aiming the six foot long silver tube, and shot himself in the chest. Imric was especially angry at the beasties, and his flaming hands spell cooked three of them in flight. Once half of the monsters had been defeated, the remaining ones flew off. The party harvested the carcasses of the dead gribbs for gear. The Free Company reached the hills that surrounded the lake a few hours before dawn, but just as they began their uphill march a fierce rain poured down from the sky above. The water created a deluge that poured through the ravines and down the hills, and the resulting flood threatened to sweep away the party. Floyd Pink, Imric, and Hammy managed to climb atop a rocky outcropping before being swept away, but Nicodemus was not so lucky. The thief started to drown, and nearly died [taking 8 points of Stamina damage] before his luck turned and he was able to grab hold of some terrain. It took eight hours for the waters to recede, forcing the party to remain exposed to the weirdling sun until close to noon. Once the ground dried, the team climbed down and made their way further into the hills. Desperate to find shelter, the party searched the area for any sign of a civilization, cave, or perhaps another cairn. What they ended up finding was an abandoned camp. The small camp provided the party with the materials to make rustic hide tents, and five reed containers filled with some kind of fluid. There was also a bit of jerky to add to rations. The party rested for a full twenty-four hours before heading back out. Day 4 Once night came on Day 4, The Free Company traveled a mile south until they reached the shore of the long sought after lake. Unfortunately, the water was highly corrosive. Wooden poles and rods placed in the water started to come apart. At the edge of the water, there was a bit of treasure: The party collected the shards, and then noticed even more treasure: While the team tried to decide what to do next, two forms emerged from the hills to the west. Somehow they had made it to the Purple Planet, and were still alive. Each gribb had 10 lbs of edible meat, and 2 razor sharp talons that could be turned into point for arrows, bolts, javelins, and darts. In addition, Marc thought up the brilliant idea of converting the gribb stomachs and wing leathers to water skins. Quotes "So, Nicodemus is looking at Hammy like a big pile of bacon right now. Care to find out about their previous quests? Follow the links below to greatness

Chapter 5 : Kepler's Three Laws

Planets , part 3. The asteroid belt between Mars and Jupiter may be the remnants of a failed planet. If so, then Jupiter is really in position 6, Saturn is in 7, and so on.

By PvM April 17, Without habitability we would not have been here, without measurability we would not have science to lead us to this conclusion. Does this mean that there was purpose involved, or just a matter of fact statement? In addition a slowly deepening bottom allows us to wade in the ocean without the immediate risk of drowning. As icing on the cake, the waves seem to approach the beach in perpendicular to the coast line adding to our enjoyment. And in addition to all this, what surely must seem to be a miraculous environment, also provide us with protection from flooding dunes. One cannot escape the conclusion that these beaches were designed with a purpose in mind. I would like to thank my unnamed colleague who came up with these excellent observations. What exciting discoveries could such an organism make in these wavelengths? And how would they lament these poor creatures on planets with opaque atmospheres. So is measurability not in the eyes of the beholder? One of the participants, David Grinspoon remarked David Grinspoon: This argument can only be used to justify the conclusion that planets exactly like Earth, with life exactly like Earth-life, are rare. From this I do not conclude that there are no other cats The Rare Cat Hypothesis , only that there are no other cats exactly like Wookie. Life has evolved together with the Earth. The biosphere has taken advantage of the myriad strange idiosyncrasies that our planet has to offer. My bet is that many other worlds, with their own peculiar characteristics and histories, co-evolve their own biospheres. The complex creatures on those worlds, upon first developing intelligence and science, would observe how incredibly well adapted life is to the many unique features of their home world. The Maverick Science of Astrobiology. But there are some differences between the arguments in Privileged Planet and Rare Earth, which I will discuss. In science, theories cannot be identical to their predictions, nor can that prediction be trivial. In fact, the Rare Earth theory is neither hypothesis nor prediction, but a description of how life arose on earth Darling continues to argue that But Ward and Brownlee go further, they actually pick and choose the factors that best suit their case. In "Privileged Planet" the authors argue that a large moon is both required for habitability and measurability. A claim which I intend to more in depth show to be erroneous. A habitable planet is a "terrestrial planet that supports complex carbon- and water-based life", a "planet in "Circumstellar Habitable Zone"" and "Planetary system in "Galactic Habitable Zone"" The main argument proposed is that: Or in other words "The same narrow circumstances that allow us to exist also provide us with the best overall setting for making scientific discoveries. The universe is fine-tuned so that environments habitable to observers will provide the best overall conditions for observation and discovery. The universe is designed for discovery" Examples of these correlations include 1. Perfect solar eclipses 2. Transparency of atmosphere 5. Fine tuned cosmos Gonzalez and Richards argue that the following requirements need to be met for a habitable planet 1. Right terrestrial planet 2. Right planetary neighbors 5. Right single star 6. Right cosmic time 8. Universe fine tuned for life A side claim What does design tell us about God? The correlation is more likely given theism than given naturalism. By its nature however measurability is biased because we are ignorant of those things that are NOT measurable. Kuehn then argues that based on physical law "constraints on measurability are entailed by constraints on habitability" Habitability requires appropriate stellar and electromagnetic energy density--necessarily, we can see more than if we were located in a globular cluster or the galactic center Kuehn then argues that several generations of stellar nucleosynthesis are required to form biologically relevant and necessary elements thus we can by definition observe a lot of stellar history. Kyler then pursues the possibility that the correlation is law like? Thus a regularity pathway blocks a design inference. ID can of course argue that the designer designed the laws but Kyler argues: Specific design input in the initial stages of the universe would then have to be proven beyond simply the ontological or cosmological argument for God. And then Kuehn gives the final blow: Science flounders towards truth: Many physical objects are hideously difficult to observe properly e. Many measurements require significant manipulation of our environment e. A Design Inference based on the correlation of measurability and

habitability is at best only trivially true. Quantifying measurability is a formidable impossible? Gonzalez and Richards, *The Privileged Planet: How our place in the cosmos is designed for discover*. But Gonzalez et al provide no quantifiable measures that help us determine if their claim is correct. The statement that habitability and measurability correlate in significantly sized zones in the universe undermines the argument that habitability and measurability are improbable and even seems to argue that measurability and habitability naturally correlate. Even more mysterious than the fact that our location is so congenial to diverse measurement what is so mysterious about this? Other than that the authors have failed to make their case that the earth is uniquely congenial to diverse measurements and discovery is that these same conditions appear to correlate with habitability appear to correlate. This is strange because there is no obvious to the authors at least reason to assume that the very rare unsupported properties that allow for our existence anthropocentric would also provide the best overall and yet the authors provide NO evidence for this optimality setting to make discoveries about the world around us. So lets look at some of the examples of measurability they quote from a variety of disciplines. Their article include perfect solar eclipses astronomy , ice cores in Greenland and Antarctica geology , deep sea cores geology , tree rings biology , stellar trigonometric parallax astronomy. Stars as isotropic emitters of highly specific information any ID paper seems to have as a requirement a reference to information and specificity J , supernovae and Cepheids astronomy , our place in the Milky way and dust extinction astronomy , the capacity to observe the maximum diversity of star types and the distant universe astronomy background radiation astronomy and the particle and event horizons of the universe astronomy. The authors do little to support this conclusion other than by pointing out that the earth has certain characteristics but are they optimal? Are they the best bench in the universe? How will we know? Little guidance is provided here. Thus linking habitability with measurability. But was the solar eclipse of required for the scientific discover of Einstein? To understand the relevance of the solar eclipse we need to remember that Einstein provided in his paper three experimental tests. Would the precession of the perihelion of Mercury not have been sufficient? Would the solar eclipse data have been sufficient without the Mercury prediction? Nature had spoken to him. These facts must, in my opinion, be taken as a convincing proof of the correctness of the theory. But of course Mercury and habitability arguments just do not seem to be as impressive as trying to present a case that the moon provides for stability of the earth axis habitability and allows for discovery measurability. Certainly the perihelion of Mercury was an earlier event than the solar eclipse. Here we also encounter another peculiarity of Earth namely that the requirement for habitability nearly circular orbit made the earth orbit unreliable for perihelion precession measurements. Predicted Observed Mercury So when Gonzalez et al claim that: This is only one example where the conditions for habitability overlap the conditions for measurability. Now the argument for habitability. Is the moon essential for the stability of the earth and habitability? As many as one in three earth like planets in their infancy may be struck hard enough by other large objects to make big moons, and one in twelve struck at a time when its tilt is sufficiently mild for it to be stabilized at a terrestrial angle currently Page 97 Darling, *Life Everywhere: I performed N-body simulations which started with the planets Mercury through Neptune with their current orbits and masses except that the Earth and Moon were replaced with two bodies the Earth-Moon progenitors , each in its own heliocentric orbit between the orbits of Venus and Mars, such that mass and angular momentum were conserved. I varied the mass ratio of the Earth-Moon progenitors, their initial eccentricities, inclinations, and semi-major axes. When a collision occurred, the bodies were simply merged into one. Slightly over one-half of the simulations ended with a collision between two planets before Myr had elapsed, and about one-third of the systems which started with five terrestrial planets were stable for Myr. Out of the simulations, 16 ended with a collision between the Earth-Moon progenitors in the right time interval; four of these 16 resulting systems resembled the Solar System in that the terrestrial planets were on nearly circular, coplanar orbits. An additional 27 simulations ended with a collision at the right time which left four terrestrial planets with a mass distribution similar to that in the Solar System. Four of these 27 resulting systems resembled the Solar System. Thus, the scenario I explored does seem plausible. If the moon were any smaller, the tilt of our planet could vary as much as 30 degrees over the course of a year. Such temperatures would be damaging to all forms of water-dependent life on Earth today. In addition calculations have shown that the tidal friction increases the*

distance between the earth-moon, eventually causing the earth to come under the influence of chaos. Neron de Surgy and Laskar report in "On the long term evolution of the spin of the Earth" that in the next 5 billion years, the obliquity of the earth can reach a chaotic stage in about 1. One may also ask why the moon adds to measurability when its dark-side has remained invisible to us from earth? But that may seem to be nitpicking, or does it? Similar arguments for design based on the earth moon system can be found God and Science website A collision which would have ejected material less than the Roche limit would have formed only rings around the earth. Computer models show that a collision of a small planet with the earth must have been very precise in order for any moon to have been formed at all coincidence or design? Comins, professor of Astronomy and Physics. For a moonless earth, the time scales for fluctuation would be as short as 10 million years.

Chapter 6 : Mike Brown's Planets: There's something out there -- part 3

The solar system consists of the Sun; the eight official planets, at least three "dwarf planets", more than satellites of the planets, a large number of small bodies (the comets and asteroids), and the interplanetary medium. (There are probably also many more planetary satellites that have not.

Contents of the Solar System and their properties: It shines with energy produced by nuclear reactions. The Sun is a star; it only appears different from the other stars because it is so much closer than all of the other stars. Many objects that go around the Sun Traditional classification into: Planets are biggest objects that orbit the Sun in roughly circular orbits, asteroids are small rocky objects that orbit the Sun, comets are combinations of rock and ice that orbit the Sun often in elongated orbits, and moons orbit around planets. Viewing and discovering solar system objects We can see the objects that orbit the Sun because they reflect sunlight. The brightness of an object depends on its distance from the Sun, its distance from Earth, and how big it is. The apparent brightness of solar system objects turns out to be similar to the apparent brightness of stars. Even though stars put out much more energy, they are so much farther away that they can appear to be comparably bright to the much closer Solar System objects. The apparent sizes of objects depend on their true sizes and their distance: For all except the Sun and planets, the combination of small size and distance means that objects appear only as tiny dots, just the same as stars Because of these last two points, it is very difficult, if not impossible to distinguish solar system objects from stars by looking at a single picture. While some solar system objects have been known for a long time, many have been discovered recently, and more are continually being discovered! How do you discover a new Solar System object? Since solar system objects are so much closer than any other astronomical objects, their motion as they orbit the Sun can be detected! Other astronomical objects also move through space, but they are so far away that their motion cannot be detected except over very long time periods. There are lots of Solar System objects! Some current maps from the Minor Planet Center. Most of the objects are very small. The amount of space between objects is much larger than the objects themselves! We have recognized for some time that there are a large number of asteroids in the Solar System; many, but not all of these are in the asteroid belt between Mars and Jupiter. These objects have been called trans-Neptunian objects, Kuiper belt objects, and Plutinos Objects revolve around the Sun, because of gravity. All planets revolve in the same direction. All of the planets revolve in approximately the same plane as well. There is very tight relation between the orbital periods, orbital speeds, and the average distance of the object from the Sun. This relation can be very well represented by a mathematical model with: Anyone seeing this relation might reasonably wonder why! As it turns out, there is a good theory that explains these relations, the theory of gravity more on this later! Planets are the brightest orbiting objects in the solar system, with roughly spherical shapes. From a historical perspective, there are nine planets: Orbits of planets are roughly, but not exactly circular. They also generally orbit the Sun in the same plane. By orbits, however, Pluto is a bit different, both in its shape and its inclination tilt of orbit relative to plane of solar system. See an orbit animation to see these points. Considering the volume covered by the orbits of the planets, the shape of the Solar System is quite flat! With these new discoveries, it appears that Pluto is one of the larger of this new group of objects. All of this has made the whole old style of classification less clear. Perhaps it is better to talk about several groups of minor planets: This is especially true for the smallest objects because there are lots of them, and some are in more elliptical orbits. But it still happens sometimes. In the past, it probably happened more, and has been an important process in shaping the surfaces of solar system objects. Occasionally, small pieces make it down to the surface of the Earth; these are called meteorites. When big objects collide, the impact can be significant! Comets are often in very elongated orbits around the Sun. They spend most of the time far from the Sun, but when they come near the Sun, material evaporates sublimates from their surface, and it is pushed away from the comet by pressure coming from the Sun. This causes comets to develop bright tails which can be seen from Earth when a comet comes close to the Sun. Objects rotate around their own axes. Most rotate in the same direction as the direction of revolution, but there are exceptions Venus, Uranus. The whole solar system moves through space. Sizes, masses and compositions in the solar system: The Sun is

by far the largest object in the solar system. Note the distinction between masses and sizes of objects. An introduction to graphs: Are there any clear patterns? Is there an easy way to tell if planets are all made of the same stuff? Some idea about the compositions of the planets can be determined by calculating their average density. The average density is determined by dividing the mass of the planet by its volume. The objects in the Solar System are tiny compared to the distances between them. Most of the Solar System is empty space! However, remember that the science part of this consists of other things as well: How did people come to figure out that this is what the Solar System is like? How do we know where all of these objects are, how big they are, and what they are made of? Why is stuff in the Solar System the way that it is? The reason that the global properties of objects in the Solar System are the way they are is likely related to the way the Solar System formed. But there are still many outstanding questions

Chapter 7 : PART 3 - OVERVIEW OF THE UNIVERSE

Part Three (Chapters) Summary. The Discovery journey had begun five years ago as a plan to send a man to Jupiter. With artificially induced human hibernation now shown to be safe, however, the extent of the journey grew—“the astronauts were to be sent to Saturn.

Discovered by ace comet-hunter Charles Messier on the night of 14 June , it passed Earth just two weeks later at a distance of only 2. On the evening of 1 July , its nucleus shown as brightly as Jupiter at its brightest, and its silvery coma was five times larger than the full moon. Messier saw it next in the pre-dawn sky on 4 August. Having moved away from Earth and the Sun, it had become small and faint. Messier observed the comet with difficulty before dawn on 3 October , then lost sight of it. Comets are today named for their discoverer or discoverers, but in the 18th century it was the mathematicians who computed their orbits who got all the credit. Comet Halley is, for example, named for Edmond Halley, who computed its orbit and determined that what had seemed like a series of individual comets was in fact a single comet that returned again and again. This was for the time a remarkably short period for a comet, raising questions as to why it had not been observed before. The giant planet had, he wrote, slowed it and deposited it into its new short-period orbit. Astronomers eagerly awaited its next perihelion in or , but nothing was seen. Again, Lexell offered an explanation: This time, it had sped up and entered an unknown but probably long-period orbit. Conversely, a flyby spacecraft that passed ahead of a planet would be slowed. It could even return to the vicinity of Earth, enter a close solar orbit, or escape the Solar System entirely. It seemed that the flyby spacecraft would get something for nothing. This was, of course, incorrect: Nature thus balanced its books. Minovitch, for his part, was not very skilled at first at explaining his discoveries; he seems to have understood the clean elegance of numbers far better than he did the fuzzy vagaries of human beings. Nevertheless, he had his champions. He ended his career there as Chief Engineer for Space Systems. Hunter permitted Minovitch to review a draft before the article went to publication. As described in the previous post in this "Challenge of the Planets" series, the leader among these systems was electric ion propulsion. In , JPL engineers had prepared a preliminary design for an automated ton nuclear-electric "space cruiser" and proudly presented it at a conference attended by about other electric-propulsion engineers. It was received with great enthusiasm. The system was still early in its development, but the JPL engineers expected that, with sufficient funding, they might develop it for interplanetary spaceflights in the s. By late , however, such brute-force high-energy systems were increasingly seen as needlessly complex and costly at least as far as the preliminary reconnaissance of the Solar System was concerned. NASA could instead use a relatively small booster rocket to place on an interplanetary trajectory a package comprising a small chemical-propellant propulsion system for course corrections, star-trackers for precise spacecraft position and trajectory determination, a cold-gas thruster system for turning the spacecraft, science instruments, a computer, an electricity-generating isotopic system or solar arrays, and a radio. By standards, such a package hardly qualified as a spacecraft, yet it remains the basic form of our proudest interplanetary flyby and orbiter spacecraft to this day. Electric-propulsion supporters were loathe to give up their labors. In addition to developing small station-keeping electric-propulsion systems for Earth-orbiting satellites, they sought planetary exploration niches where electric propulsion could outshine gravity-assist trajectories. Before the end of the s, the Comet Halley apparition became a particularly important target for electric-propulsion supporters. Their efforts to explore Comet Halley using electric propulsion will be described in forthcoming posts. The Voyager 2 sequence of flybys has been touted as a once-in-years opportunity to visit all the outer Solar System planets during a single mission; Minovitch, however, was quick to point out that this claim is spurious. In all, its primary mission spanned just over 12 years. The intrepid spacecraft then began its Interstellar Mission, which continues to this day. At this writing, Voyager 2 is more than 19 billion kilometers from the Sun; unless humans catch up to it and reverently bring it home, it will in centuries to come depart the Solar System entirely and wander among the stars. Minovitch calculated Venus-Earth gravity-assist trajectories; these came in handy beginning with the loss of the Space Shuttle Orbiter Challenger 28 January and subsequent

cancellation of the Shuttle-launched Centaur G-prime upper stage. The accident and stage cancellation grounded the Galileo Jupiter Orbiter and Probe mission, which had been set to launch to Earth orbit in May in a Space Shuttle payload bay then boost directly to Jupiter on a Centaur-G-prime. The Space Shuttle resumed flights in September Galileo was launched in the payload bay of the Orbiter Atlantis 18 October and boosted from Earth orbit using a solid-propellant Inertial Upper Stage that was incapable of sending it directly to Jupiter. Instead, Galileo flew by Venus 10 February , Earth 8 December , and Earth again 8 December before it built up enough speed to begin the trek to Jupiter. Galileo reached Jupiter on 7 December Over the course of 35 Jupiter-centered orbits, it explored the four largest Jovian moons using gravity-assist flybys to speed up and slow down. A final gravity-assist series caused it to orbit nearly 26 million kilometers from Jupiter and then perform a pre-planned death-dive into its atmosphere on 21 September Hunley, editor, , pp. Flandro, *Astronautica Acta*, Volume 12, Number 4, , pp.

Chapter 8 : Living 4 Crits: Banished to the Purple Planet - Part Three

It is strange that Lexell's Comet is not better remembered. Discovered by ace comet-hunter Charles Messier on the night of 14 June , it passed Earth just two weeks later at a distance of only million kilometers, closer than any other comet in recorded history.

According to the latest findings, we see that solar and geomagnetic activity changes rapidly, and during the solar cycle, as the number of sunspots increases or decreases, the psychology, behavior, and creativity of people change and historical trends are affected. The magnetic storms caused by the Sun interrupt communication and other sensitive electronic systems, both on Earth and in space. They also affect humans, because all our thoughts and attitudes are determined by the communication between billions of brain cells, which are more sensitive than any complicated electronic device. Solar activity changes on a daily basis. The Earth is hit by electrons, protons, and other particles brought by the solar winds. This causes some direct changes in the magnetic field, triggers changes in brainwaves and hormones, and consequently affects human behavior. During this magnetic polarity, a great energy is sometimes released that causes huge geophysical events, and, more importantly, this can affect human DNA and lead to evolutionary changes. In addition to geomagnetic changes, anxiety and irritation increases during the solar winds. When solar activities increase, we also observe an increase in the number of accidents, diseases, murders, and other crimes. Aleksandr Leonidovich Tchijevsky, who was a Russian scientist, observed that the human nervous system was highly affected when the radiation emitted by the Sun and Earth was at its highest. Psychological disorders also peak. Some scientists, such as Dr. Robert Becker and Dr. Freedman, claim the changes in the sun cause an increase in psychopathic activity. During active geomagnetic storms, anxiety, depression, and suicidal tendencies increase. The changes in the geomagnetic activity of the sun also cause changes in blood pressure, reproduction, the immune system, and neurological disorders. Problems with the heart and circulatory system also increase. In astrology, the Sun is related to the heart and circulatory system, so it is reasonable that any disruption in the sun would affect the heart. When solar activities are at their maximum, it is not only murders, terror attacks, accidents, and health problems that increase. Creativity in sciences and arts also improves during the solar maximum, and many developments are experienced in the evolutionary process. Research shows that human creativity peaks during the solar maximum. In astrology, the Sun represents creativity, but it also symbolizes enlightenment, consciousness, will, and awareness. Solar activities will certainly help us to reach high levels of consciousness and awareness, and we will benefit from the creative and beneficial energies. As a result, this period of high solar activity is a transition time and an opportunity to make a quantum jump in our consciousness. This is a period when we can get in touch with our higher being, when we can realize many things about the relationship between humanity and the cosmos, and when both our individual and collective awareness will increase. In astrology, the Sun stands for essence, integrity, and consciousness. Even if events prove to be harsh and stressful, we can overcome the difficulties through our will power and protect our integrity by being in touch with ourselves. Never forget that the planets and the Sun do not have will power, but we do. The challenging events we face test our will power, and the planets are the tools that trigger these tests. The ancient astrologers worked on the effects of the planets on people by defining their astrological meanings. The Direct Effect of the Planets Observations show that many sources outside of our planet affect human behavior. The magnetism that exists within the cosmos affects the biological cycles in many living organisms, including humans. According to Michel Gougelin, the biological clocks of humans are directly related to the planets. The planets with a vital role in the formation of solar activities increase the fluctuation of gases within the Sun, leading to sunspots and emissions. The radiation of the planets, which we feel through magnetic signals, affects the center of the Earth and the Sun, both directly and indirectly. Even when there is no solar activity, the positions of the planets also affect geomagnetic activity. The electromagnetic radiation of the planets also affects the center of the Earth as well as the Sun. The planets, affecting both the center and the surface of the Sun, change the magnetic field of the Earth and affect biological life as a result, so they naturally have an effect on humans. Planetary alignments, which can be

considered to be combinations of electromagnetic forces, lead to an increase in solar activity. This disturbs geomagnetic activity, and humans are affected as a consequence, because humans also have magnetic fields that are related to the magnetic field of the Earth. Findings show we are not only within the magnetic field of the Earth, but we also have our own individual magnetic fields. Any change in the magnetic field of the Earth affects our own. These small fields tend to harmonize with the big one, but individual differences can shift the effect. Humans react differently towards the shifts in the magnetic field of the Earth. The reason for this can be seen in the natal charts. The planets do not directly cause the events of our lives: The energy is formed by the aspects and combinations of the planets and stimulates the nervous systems of humans, who then act. Consequently, humans tend to react in a state of mind that fits the dominant electromagnetic stimulants. Of course, our reactions are not inevitable. Some of us react in a subjective and responsive manner, while others are more conscious and objective. Some sensitive people may be affected more and become hyperactive and aggressive. It is our choice to behave reasonably or unreasonably. The planetary positions in our natal chart have a crucial role in determining our choices and reactions. Our natal charts show we have different bio-fields that can also be seen in Kirlian photographs. This explains why we respond differently towards certain planetary combinations. For many years, astrologers defined the different effects of the planets and categorized them. Using these, we can forecast which planets or combinations cause certain behavioral patterns and what types of events can be experienced. Our character is our destiny. The planetary combinations in our natal charts give us important hints about our tendencies while creating our own reality. The people recognized there was a link between human behavior and the planetary positions. By examining the movements of the heavenly bodies, they realized there is a relationship between these movements and the moods of the people. The most prominent of these heavenly bodies is the moon. Lunar Effect We are surrounded by billions of stars, planets, and other celestial bodies that fill the magnificent design of the cosmos in a balanced way. Any change in this balance undoubtedly affects us. The most obvious effects in our solar system are based on the luminaries: The Sun and the Moon. An example of this is the tidal effect. Through this mechanism, the Moon affects our daily lives. It also affects the biological clocks and the mental attitudes of all living organisms through a mysterious mechanism. Nothing stays the same in terms of thoughts and attitudes. In astrology, the characteristics of individuals and the involuntary and emotional features of their spirits are determined by the position of the Moon and its aspects with the planets. The aspects of the Moon in the natal chart do not only express the emotional mood and needs of the individual, they also point out the daily shift of emotions and the development phase of events. When the Moon aligns with another planet, it increases the energy of that planet. This alignment significantly affects life on Earth. For example, when Saturn is close to the Earth and aligned with the Moon, we feel its repressive effect. When Jupiter is close to the Earth and aligned with the Moon, optimistic feelings become more dominant. Many civilizations observed lunar phases and made their plans according to long-term weather predictions. Lunar phases help us understand weather conditions and their effects on life. Two phases of the Moon are most important: The new Moon and full Moon. As the number of positive ions entering is temporarily higher, humans and animals feel repressed. Some scientists say humans are bombarded by a wider spectrum of electromagnetic waves during full Moons. The Earth is negatively loaded normally, but during full Moons it is loaded with positive particles. As humans are also negatively loaded, they are influenced by this change and feel repressed. Sensitive people are influenced more by full Moons. People who are restless may give exaggerated responses and make themselves and others uneasy. They may behave in a way they always wanted, and their attitudes become sharper. In some extreme cases, they may go mad. People who tend to be violent may give harsh responses. It is well known that suicides, accidents, and heart attacks increase during full moons. In the new-Moon phase, the Moon enters between the Sun and the Earth, and its physical body obstructs the particles coming from the Sun, and some geomagnetic disturbances are experienced. Payne During full Moons, our creativity also peaks. It is the time to give birth to new things. Everything now becomes evident. Instead of acting alone, this period gives us the energy to act together. Consequently, full Moons allow us to integrate and exchange love instead of conflict and diversity. As I emphasized before, the Sun, the Moon, and the planets are the universal powers that emit electromagnetic waves. We respond to these energies in the light of our consciousness and awareness

level. The changes in the Sun and the magnetic field are related to the relative positions of the Sun, the Moon, and the planets.

Chapter 9 : SparkNotes: A Space Odyssey: Part Three (Chapters 15–20)

A) A line joining a planet to the Sun moves equal distances along the planet's orbit in equal times. B) A line joining a planet to the Sun sweeps through equal angles in equal times. C) A line joining a planet to the Sun points in the same direction at all times.

Find out more A thoroughly sporadic column from astronomer Mike Brown on space and science, planets and dwarf planets, the sun, the moon, the stars, and the joys and frustrations of search, discovery, and life. With a family in tow. Or perhaps in mutual orbit. Part 2 described some of our early theories on how Sedna had gotten there and what it was telling us about the early history of the solar system. Seven years ago, I knew with certainty that the discovery of Sedna in a strange orbit that never brought it close to any planet was telling us something profound about our solar system. I also knew that Sedna would never divulge her secrets alone. We had to find more because if there was one thing that we know for an almost certainty, it is that Sedna is not alone. Each of the different theories about why Sedna exists predicts something very specific about the other things that must invariably exist in the outskirts of the solar system along with Sedna. For example, if Seda has been kicked into its current orbit by an unknown Planet X orbiting somewhere not far beyond Neptune, then this X would have done a lot more kicking, too, and the others out by Sedna would all have orbits which travelled to the far reaches of the solar system but then looped back to the location of X. The spot they all travelled back to would, in fact, mark X. Objects out by Sedna would be at every tilt, distance, and elongation possible. The other theories each had their own unique pattern, too. If we could only find more of these distant unexpected objects like Sedna, we could read their pattern " or their lack of pattern " to understand precisely what had happened earlier in the history of the solar system. It would be easy, if only we could just find a few more. Sedna itself had been an unexpected discovery in our ongoing search of the skies. Night after night we were systematically scanning the darkness, looking for faint points of light moving slowly over the hours. And when we realized that we needed to find more, my first thought was simply: At the time that we found Sedna, we had covered about a fifth of the sky. So by simply continuing our normal search we were bound to find something good sooner or later. Find something good indeed! In the years that followed, as the area we had searched grew, we found Orcus, then Haumea, then Eris, then Makemake. The outer solar system would never be the same. But the one thing we never found was anything remotely like Sedna. Not finding anything else like Sedna was disappointing, of course, but, really, not surprising. Sedna was so far away and moving so slowly that we had almost missed it the first time around. In fact, most of the time Sedna is so far away from the sun that it would be moving so slowly that we would have missed it entirely. We were lucky to have found Sedna to start with. We would need luck to find more. And better than one plan, we decided on two plans. In our case, watching more carefully simply meant taking pictures further apart. In our first search across the skies, we took 3 pictures spaced by 3 hours. Anything that moved even slightly during those 3 hours was suspect. But something so far away that it looked stationary over 3 or 6 or 10 hours we would have just called a star like everything else stationary in the sky. Take pictures further apart. Consistently taking pictures of the the sky more than 3 hours apart during a single night is hard, so we switched, instead, to pictures 24 hours apart. Even better, after the discoveries of Eris and Haumea and Makemake, other astronomers were willing " eager even " to monopolize the telescope for our quest. Where our previous search had occupied at most 2 hours per night on the inch Schmidt telescope at Palomar " a telescope specialized for broad views of the sky like we needed " our new survey was going to take fully half of all of the time available. We would sweep up the sky at an incredible rate. We were going to go so fast, in fact, that we decided it would be best to simply start from the beginning. So after having finished the largest astronomical survey for slowly-moving objects in modern history, we immediately turned around and began an even larger astronomical survey for even more slowly moving objects. What an exciting survey! In our earlier survey we had found almost all of the known major dwarf planets. Now we could see things even 8 times further! If Sedna was the tip of the iceberg, as we suspected, we were about to be overwhelmed. For 18 months we probed night after night. In fact, we only had a few days left before the telescope was to be taken out of

service for major refurbishment, when something slow moving finally appeared in our pictures. It was far away – OK, not quite as far away as Sedna – but, still, it could be the next piece of the puzzle for which we were looking! There was one problem, though. We had no choice but to wait, come back a full year later, and look again.