Observer Staff
Editor & Publisher:
Paul Winalski

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Fall Messier Marathon

President's Message

Ah, fall, my favorite time of the year. The nights are cooler, the skies darken earlier, and the bugs die off. Perfect for visual observing. Speaking of which, just under two weeks now to our fall Messier Marathon. In celebration and preparation for that event, **Ed Ting** will deliver his fall planning session as the evening program at the September business meeting. Having done several spring marathons, the fall version presents some interesting challenges and shifts in thinking that will catch you by surprise. Unfortunately, I will not be able to attend since I will be Maine on a camping trip planned a year ago. I hope to observe in the darkest skies to date since I have been enjoying Astronomy. If all goes well, I will have a nice trip report to add our fall marathon event. I would like to extend my personal thanks to the Wicketts for hosting NHAS again this year.

Everyone should have seen by the now the recent announcement pertaining to the membership dues increase. As a reminder, please read the FAQs; for common questions, visit the website forum; email me for any questions not addressed, or have your list ready at the September business meeting. The officers and I will get them answered for you.

We enter Q4 with some nice momentum with weather and as a result, some great sky watches have taken place. I was even able to get out and help a few times which really makes me feel great. When I joined NHAS, I had not thought much of helping out with sky watches, but over the years it has brought tremendous satisfaction to me. At a recent sky watch, this really hit home to me seeing a disabled child enjoy several objects looking through Obby. It gave me a chill up the spine and reminded me just how wonderful the hobby can be when shared with others.

I am working on guest speakers for October and November. Please review the guest speaker list on the website forums and let me know if anyone has some ideas. We are set for December, which I will announce at a future date. Finally, it is not too early to think about elections for 2010. At the October meetings, the nomination process may begin so I encourage all members to think about whether you wish to serve or nominate someone whom you would like to see serve.

✶ Rich DeMidio
NHAS President 2009

Highlights for This Month

As Rich mentioned, we've been blessed with decent weather over the last month, and as a result we've had good opportunities for observing and renewed astrophoto activity.

See the article in this Newsletter on the club's fall Messier Marathon. These events are informal and just plain fun, even if you don't plan on running the marathon, or even if you don't plan on doing any observing at all. The monthly Coffee House Night falls on the same evening, but I suspect all the action will be at the Wicketts and not at YFOS. I hope I'll see you there.

And be sure not to miss **Ed Ting's** presentation on tips and tricks for a successful Messier marathon at this month's business meeting.

Finally, **John Bishop** explains the scientific underpinnings of the theories of multiverses.

✶ Paul Winalski
NHAS Secretary 2009

Astro Photons

Clear skies have returned, and our intrepid astro-imagers have returned to work. Don't miss the wonderful new images that have been posted recently in the Pictures section of the forums section of the NHAS website.

✶ Paul Winalski

Recent Public Sky Watches

McAuliffe-Shepard Discovery Center, Monthly Sky Watch, 4 September

We had cloudless skies, but also a full Moon that lit up the moisture-laden sky. Not the best of observing conditions, so I concentrated mainly on double stars, including Polaris, Mizar, 61 Cygni, Albireo, and Cor Caroli. I did also show NGC 457 (the Lobster Cluster), M13, M57, the Perseus Double Cluster, and, of course, carbon star T Lyrae. We could just barely see the core of M31. I could also see M32, but only because I knew were to look for it.

Jupiter was the other attraction for the evening. Three moons were visible.

Early in the evening we had a very fine mag –3 Iridium flare right near Albireo in Cygnus.

About 100 people got to enjoy the fine views. Fortunately we had a fine turnout from NHAS to handle the crowd: **John Bishop**, **Ken Charles**, **Rich De Midio**, **Steve Forbes**, **Stephen Forbes**, **Mike Frascinella**, **Gardner Gerry**, **David 'Rags' Gilmore**, **Brian Icaza**, **Joyce Icaza**, **Peter Kelly**, **Evan McCartney**, **Scott McCartney**, **Jim Robidoux**, **Bill Steele**, **Marc Stowbridge**, and **Paul Winalski**.

I received this message of thanks from **Dave McDonald**, Director of Education at the Discovery Center:

"I would like to again thank all the NHAS members for their continuing support of our "First Friday Night" sky watches at the McAuliffe-Shepard Discovery Center. The night of September 4th boasted over 100 visitors and they seemed to have loved the opportunity to look through scopes and interact with such knowledgeable people that have a passion for astronomy."

✶Paul Winalski

I also helped two people who brought their own telescopes to set them up and do some basic observing with them. This is the second sky watch where I've done this, but since I had my own scope there, I wasn't able to give them the time and attention that I would have liked. I encourage members who don'' have a scope with them to think about attending a sky watch anyway, just to help out members of the public who may bring a scope to show them how it works.

✶Scott McCartney

Fall Messier Marathon

Starting at 6:00 PM on Friday, 18 September and continuing to the morning of Saturday 19 September, NHAS will hold its fall Messier Marathon event for club members and guests. In mid-northern latitudes, at or near the Vernal Equinox, it is possible to observe all 110 of the deep-sky objects in the Messier catalogue in one evening, literally from dusk to dawn. Doing so is called "running the Messier Marathon". NHAS traditionally holds such an event in March or April at the **Lopez** house.

While all 110 can't be bagged in the fall, September holds nearly as good an opportunity to view a large number of Messier objects. NHAS member **Scott Wickett** has opened his home in Lyndenborough to us for this major club social event. Come and join the very informal competition to see how many Messier objects you can find from dusk to dawn. If you've never seen a Messier object before, this is a great time to learn where and what they are. Or come just to socialize even if you don't have (or want to bring) a scope. This should be a really fun evening for everyone.

✶Paul Winalski

Moonless Jupiter!

3 September, Merrimack, NH: Well, this is something you don't see every day. Usually all four of the Galilean moons of Jupiter are visible. Sometimes you only see two or three. But NONE of them visible? According to *Sky & Telescope's* website article today, that only happens a few times a century.

It happened tonight, between 0:46 and 2:32 AM EDT, 3 September 2009.

At 9:28 PM 2 September, Callisto disappeared behind Jupiter's disk. One down.

At 11:44 PM, Io disappeared behind Jupiter's disk. Two down.

At Midnight, Europa began a transit of Jupiter's disk. Three down.

At 0:40 AM, I set up the TeleVue 85mm refractor to observe the transit of Ganymede, and the start of nearly two hours of Jupiter being moonless.

Seeing was exceptional. These were among the steadiest skies I've ever seen in New England. I was able to get a sharp image with my most powerful eyepiece—a 3mm TeleVue Radian. I tracked Jupiter over the next seven minutes and watched Ganymede, initially a hair's breadth away from Jupiter's disk, edge ever closer, touch, and then start its transit, nearly across Jupiter's equatorial belt. Even in this small scope, pushed to the limit of its resolving power, I could see the disk of Ganymede superimposed on the equatorial belt, albeit only because I'd followed it in from first contact.

Jupiter looked rather strange all by himself, with no accompanying moons. It was well worth staying up to see this!

✶Paul Winalski

Random Acts of Observing—California Dreamin'

I hated to miss our monthly Friday night skywatch at the McAuliffe-Shepard Discovery Center, but I was spending the week in California on business. I always bring my 80mm grab-n-go refractor on these trips (in a carry-on case) but at this time I don't own a simple alt-az mount, having sold my AT Voyager to a friend last month. So I when I was packing I figured what the heck and tossed the iOptron Minitower and tripod (minus counterweight of course) into my rolling duffle bag, stuffed my clothes around it and entrusted it to the gentle souls of United Airlines baggage. Just under 50 lbs for the whole bag, good thing the counterweight stayed home and that bubble wrap doesn't weigh much. With the built-in batteries this mount is a great performer for any visual work, even on its original (too short) tripod legs which turned out to be just the right length for the LL Bean wheeled duffle bag.

No problems were noted with the gear upon arrival, so by Tuesday evening I was ready to stay up a bit later than 8 PM (add 3 hours for East coast equivalent) so I headed out to the local Safeway and set up the Minitower and 80mm refractor on the sidewalk right by the entrance. I did a rough N-S alignment, told it to find Jupiter, then un-clutched both axes, got the

planet centered and re-tightened both clutches. That was all it took for good tracking for about fifteen minutes before I had to adjust for drift since I had not leveled the base very well. About fifty people stopped by on their way in or out of the store and we alternated between the gibbous Moon and Jupiter. People's responses mirrored what we see and hear locally—very few had seen Jupiter or any planet in a telescope. The seeing was incredibly good and we saw lots of cloud bands.

I repeated the viewing evening again on Thursday (no moons on Wednesday!), and by now the moon was full enough that I left the scope pointed to Jupiter all evening. High winds aloft made seeing much worse than Tuesday, but the two main equatorial bands were still visible. Additionally we saw one moon (Ganymede?) peek out from behind Jupiter and get farther away over the course of the evening. I asked people who were going into the store to try to memorize the distance from Jupiter to Ganymede and stop by on their way out to see if it had moved. Those who stopped again all agreed it was farther away than when they had arrived—Galileo's observations confirmed! Several people saw me there again on Thursday evening and rushed off to fetch their kids who had looked through the scope on Tuesday for a repeat view. The Bay Area has a fairly young and well educated population, but the number of people with telescopes seemed just as small as I usually find back here on the east coast, maybe 5%. I told lots of people about the San Jose club as well as the SF Sidewalk Astronomers, both of which have monthly free sky watches.

The high point of my evening was meeting a lady who told me that over twenty years ago when her son was four years old, she had taken him to a San Francisco sidewalk star party where they met a gentleman named John Dobson who, along with others, was showing people the night sky. She knew about John Dobson's whole life story and her son still remembers that evening. I guess you never know when you'll have that kind of impact, but it's sure fun sharing the views. When people ask me what my telescope cost, I just tell them what I heard from someone (may have been Dobson himself)—that my scopes are valued by the number of eyes that have looked through them and I thank them for increasing its value. They always smile, and so do I.

✶Ted Blank

Multiverses and Non-Science

A Little Bit about Me

My four grandparents were young men and women in the early 1900s. Each of them individually decided that religion didn't make any sense to them and they left their respective faiths. They married; brought their children up in this non-faith; the children married and continued the family tradition. The result is that I am a third-generation atheist—a rather rare thing. This has two consequences: first, I think I can guarantee that there will be no evangelizing at the end of this presentation and second that I don't get angry when others evangelize because that kind of belief has no lingering hold on me.

A Little Bit about This Presentation

I'm going to start out talking about what "Science" is and isn't. Then I'll talk about what we know and don't know and point out some areas of speculation and why scientists speculate, even if speculation isn't science. I'll introduce some of the wilder speculations and with luck will reach some kind of conclusion!

What is Science?

Most of us know of philosopher of science Sir Karl Popper and his definition of science as that kind of knowing that is subject to the test of "falsification". In a more general sense, science is a process for continual improvement in the predictive models we have. If you don't have a model, or it isn't predictive, then it's not science. Now, it's not necessary to have a mathematical model, though most science uses math. The ones that don't often want to so they can be more scientific. It's kind of a joke among scientists that other disciplines have "physics envy"! We like math because it's easy to say a lot with a little and it's easy to calculate the predictions; a model in words makes us worry that there are uncovered cases or fuzzy terms. That's the problem with "The Law": it's all in words, and so there are disagreements. But it's not a problem with "C++", because though C++ is done in words, it's fully defined and thus you could produce a model which was a program and it could be a scientific model.

Secondly, the model has to predict. Most of us probably think in terms of laboratory science with "experiments". That's a really good way to drive for falsification. But there are sciences which by their very nature can't do experiments. Geology is a good example: we can't call up a volcano or an Ice Age to test our models. So how do you do science if you can't do experiments? Well, you look for "natural experiments". You say, "if my model is correct, then there will be such-and-such a kind of rock near existing volcanoes", or "there will be a lack of top-soil in the area I say was glaciated", and you go looking for that evidence. This isn't hard to do when the process involved is still going on today: we have volcanoes and continental ice-sheets today so we can look at current instances to help with the model. It gets harder when the process only happened in the past. That's why it took so long for people to be sure that the Meteor Crater in Arizona was a meteor crater: if we'd had a big crater in every state it wouldn't have taken as long.

Prediction also means predicting more than you start with. If I have a six-sided die and I claim I can predict which face is up if you tell me which face is down, my model isn't very interesting. If the number of inputs is a lot less than

the number of outputs, then it's more interesting. That's one reason why Isaac Newton's theory of gravity is so famous. It says you only need to know the locations, masses and velocities of the big objects in the Solar System and then you can predict all their locations for the rest of time!

The hardest case is when you only have one of the thing you're studying: you can't tell whether some characteristic is really significant or not, as there are no other cases to compare against. There's an ancient language of pre-Roman Italy called "Messapic". It's barely known: even today we only have about fifty short bits of text and back when I was a college student there was only one known sentence in Messapic. Here it is:

> *klohi zis anthos thotorridas ana aprodita apa ogrebis*

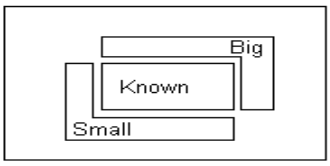
Back when it was the only text, how would we have been able to know whether the author of this inscription made a spelling mistake? (By the way, it's thought that that line is dedicating something to the local equivalents of Zeus and Aphrodite).

We could find more Messapic texts, but we can't find more Universes, so cosmology has to be the ultimate case of trying to do science when you can't run experiments and you can't find other examples. Well, there's exobiology, known as "the science without a subject "– but so far exobiology is really engineering: the scientists say "With known chemistry and physics I can design this new form of life." So far it's been fantasy engineering as well because I've never heard of people actually making methane-breathing life. But I suspect this is going to move into real engineering fairly soon. Even so, it won't be predictive and it won't be a science until we find some alien life.

What We Know, Guess or Speculate

Science has been tremendously successful, so much so that we talk about "knowing" something rather than having a model which has been 99.99-plus percent reliable up to now. But it's been more successful in some areas than others.

Let's imagine a diagram. It's a rectangle, like a blank painting. The vertical axis is size, so that the bottom represents the infinitely small and the top represents the Universe as a whole. The horizontal axis represents time, so that the left edge represents the Big Bang and the right edge the end of the Universe, whatever shape that's going to take. Let's assume the scale is appropriately scaled, some kind of logarithmic scale such that "here and now" is a point in the center of the canvas.



What we "know" – where our models are really good – is a small area around that point. We have really good models for things from molecules to galaxies and from the late part of the Big Bang – say three minutes after – and on into the future for a few billion years. The difference between that three minutes and the several billion shows you that the scale is logarithmic! In that region, we can make very good predictions: we can build bridges that work, send out spaceships that get to Saturn, design electric motors and so on.

Now, outside that region our models don't work so well. Sometimes we have other models which work, but there's a problem where two models overlap. For example, we have a very good theory of quantum electrodynamics which predicts atomic-scale events really well, and we have a very good theory of special relativity which predicts events involving gravity at scales a bit larger than atoms very well. But we don't have a way to connect the two. So when you want to understand something which is very small and has a lot of gravity – like a black hole – you don't have a theory. This is a very famous gap; every ambitious physicist has probably taken a stab at concocting a theory of "quantum gravity", because if you ever can come up with one, a Nobel Prize and world-wide fame are absolutely guaranteed!

The very small turns out to be related to the very early for two reasons: the early Universe was smaller so small-scale events were important and the early Universe wasn't early for very long, so things could be "beyond the horizon" if they were just a millimeter away, because that was too far for light to get in the time available. So on the left and bottom of our "Known" area is an area we can label "Small": it's the realm of quantum gravity and the Theory of Everything and Strings and so on. There's a lot of interest in doing science in "Small" and much of it is real science: we have models, we can do experiments or find examples – but we have lots of competing models and they don't predict as well as we'd like.

At this point I'll just mention in an aside that there are some problems with String Theory, the chief of which is that so far it has created lots of very complicated models but hasn't come up with a single falsifiable model. But Strings deserve their own lecture, and this isn't going to be it.

The very large is connected to the very late for similar reasons: the large-scale Universe is dominated by gravity and an expansive force we barely understand. The current name for that force is "Dark Energy", but that's not much more helpful than "Unknown Force"! Maybe the expansion is part of gravity, and our current model of gravity is missing a correction for very long distances and very large times. Maybe there's a different force. Maybe there's more than one. In any case, using our current gravity model, we have to postulate that there's this other stuff going on, and the long-term fate of the Universe depends on how this other stuff works. So we can label the top and the bottom edges of "Known"

with "Big" and note that both "Small" and "Big" are areas of Guessing and Trying rather than Knowing, as well as good places to look for a Nobel Prize.

The edge of the diagram needs a label as well. One way to think of science is that we are collecting bits of knowledge about this and that, but that our ultimate goal is to answer the two real questions, the ones we really want an answer to. Why is there anything at all? Given that there's something, why is it this? In other words, we want to do some Cosmology!

Now we're speculating. That's a good thing! Speculation leads to wild ideas and if we have a lot of wild ideas, we can work out the implications of those ideas and throw out the ones that wind up contradicting something we know. This gives us a few possible ideas and they can be guides for further work. If you don't have speculations to start with, you can't wind up with hypotheses which might just grow up to be theories. So while wild speculation at the edges of the known area isn't science, it's in the service of science, it's scientific.

Free Parameters

I'm going to take a detour back to how models work. You may remember the formula for falling objects on Earth – that the acceleration is thirty-two feet per second per second. That "thirty-two" is a parameter: it's a number, and it doesn't seem to be the consequence of anything in particular. "Why is it 32 and not 3.2 or 320?" you ask. "Well, we've measured falling objects and it's 32", say the scientists. Then you go to the Moon and measure again and the number there is different – more like 3.2 feet per second per second. You could go on to all the planets and moons of the Solar System and measure falling objects and you'd wind up with lots of these numbers. In the unlikely world in which we have interplanetary travel but no theory of gravity, these would just be numbers you'd have to memorize and there'd be one for each body in the solar system, just as there is a mass and a semi-major axis: one more number for each object in the Solar System.

But we do have a theory of gravity, and it lets us see that all these numbers are the result of combining the mass and the square of the radius of an object. We don't need to memorize the surface acceleration of each object; we can calculate it from other numbers we already know.

The gravity theory still has an unexplained number in it—**G**—which is just an input based on our measurements. The relativity theory has the number **C** and other theories have more numbers. It's not unreasonable to wonder whether some of these numbers are calculable rather than just something to memorize. Historically we used to have more constants, so this has happened already. People who've tried working with the whole of what we call the "Standard Model" have reduced the number of unexplained numbers to somewhere between six and twenty, depending on how much of science gets included and who's doing it. You can't say which six it is: any set of formulas can be manipulated to make the unexplained number appear here or there: it's like having a formula, a model, which relates weight to height. You can make the formula predict the weight from the height and you get one number; or you can make the formula predict the height from the weight and you get a different number. But in either case you have a number.

If there are six, or twenty, numbers, and they just have the values they have, that means there isn't any reason we know they couldn't have other values. Our models would then describe a different Universe, but it wouldn't be inconsistent. As far as we know, it could exist.

There are two ways to respond to this idea: one is to assume that we just don't have the right theory yet (remember quantum gravity?) and when we do, all these numbers will be more or less obvious consequences of deeper things, like the number of ways you can arrange three things two at a time. In other words, this is a claim that these numbers aren't "Free Parameters". They have the only values they can have.

The other way to respond is to say that these six numbers were just the luck of the draw when our Universe got started – there are some theories about the Big Bang which have this feature of starting out in a state of the Universe without a distinct value for these numbers and which "freeze" the values at the time the Universe cools down a bit from unimaginably hot to merely almost unimaginably hot. This means the numbers are characteristics of our Universe, but not requirements for a Universe. They are "Free Parameters".

The Multiverse

Now if these numbers are free parameters, then if there were other Universes, they would probably have other values and thus different physics and different histories. When scientists calculate the implications of different values for the free parameters, they wind up discovering that very slight changes to any of them would probably rule out human life. So maybe there's only one Universe, but we are incredibly lucky, we rolled the dice and got a thousand sixes. Scientists don't like the idea that we are incredibly lucky. Science has had a lot of success by assuming that we aren't in a special position or time. This "Assumption of Mediocrity" has served scientists well and they don't casually ignore it – but note that the assumption is not science; it's a tool to use when speculating.

What are those things that are conducive to human life? A long-lived Universe so we can have billions of years for biological evolution and multiple generations of stars to create elements beyond helium. The existence of stable elements beyond hydrogen so we can have biology. Numbers which mean that hydrogen can fuse to helium and produce energy, but at a slow enough rate that stars are large

and thus long-lived. Enough matter to form galaxies but not so much that collisions between them are common – things like that. These also happen to be characteristics which are conducive to the formation of black holes, which we'll come back to later.

One way around this assumption of luck to assume that there is a very large number of Universes, each with randomly-chosen values for the six (or twenty) free parameters. Most of these Universes, it turns out, collapse immediately or expand to an empty vacuum – they aren't very interesting. If there is a very large – and we're talking truly astronomical numbers here, like10**300 – number of Universes, then it's not so surprising that one of them has the right numbers for human life. That's the "Multiverse" people talk about.

One way to get a Multiverse is to have a single Hyperverse filled with the pre-Big Bang material (whatever that is), and have Universes nucleate in by a process analogous to the way fog droplets nucleate in saturated air. The Universes then expand into their own space-time so they don't have any impact on the Hyperverse. In this model, the various different Universes are siblings.

Another way to get a Multiverse is to look at black holes. We don't have a full theory of black holes – that's quantum gravity again – but our current models say the core of a black hole looks a great deal like the very beginning of the Big Bang. If each black hole is indeed the creation of a baby Universe, then Universes have ancestors and offspring. If you make some more assumptions, you get a great neo-Darwinian speculation starting with a single random Universe (you don't need a Hyperverse).

What if each child Universe gets parameter values which are different from, but close to, the values of its parent? Then if the values for this Universe create physics in which black holes are common, this Universe will have lots of offspring with very similar values, while if the parameters don't code for lots of black holes, this Universe will have few or no offspring. It's like competition between bacteria: the ones that are good at reproduction will wind up dominating.

This means that almost all Universes will have parameters which are good for creating black holes. We look at our Universe, and we see that it does indeed create lots of black holes, so it's one of those common Universes. It's just a coincidence that the things that make a Universe create lots of black holes are also things that make it a good place to evolve human life, but it's a lucky coincidence for us. On the other hand, we're nowhere near as lucky in this child-Multiverse model as we are in the sibling-Hyperverse model and we're in an ordinary, common Universe again.

You'll notice I said "human life". Maybe the other Universes are unfriendly to human life but they are friendly to some other kind of life, and this very argument is going on over there right now and our kind of Universe is being held up an example of how a Universe can be unfriendly to alien life. But our kind of life is the only one we know (exobiology again), so it has to be the one we talk about.

Anthropic Principles: Weak, Strong and Otherwise

That leads right to the "Anthropic Principle". This is the name for a set of related ideas which start with a tautology and move on to universal law, so they deserve some discussion.

The "Weak Anthropic Principle" is the tautology: we can only observe from environments which permit us to observe from them. If I can stand here and see the wall, then this environment must permit me to stand here and see the wall. We can modify this to include our agents, like the Voyager spacecraft or Mars rovers. Most people think this principle is just the same idea twice, a version of "A is A". But despite being tautological, it's useful for us to remember that we shouldn't expect to observe things that only happen in environments we can't be in, such as the early Big Bang. The application to Multiverses is that we must be in a Universe which allows us to have evolved and to exist now, but that we shouldn't be surprised at that. If it's only the one-in-a-gazillion Universe that supports human life, that's the one we'll be in.

The "Strong Anthropic Principle" is that the Universe must have these particular parameter values so that it can contain observers. This isn't a tautology, it's a statement that either the Universe (or Universes) has a goal, or that there's a connection between the appearance of observers after 13.7 billion years and the values of G and C and so on frozen out of the chaos of the Big Bang in the first tiny fraction of a second.

You can see that the "Strong" principle can be taken as theology in the disguise of science: the parameters are set by a Creator to make a Universe that will in time evolve us. But there are some non-religious attempts to justify the "Strong" principle. One of the few I understand is based on one of the ways to understand quantum mechanics. I'm not going to try to explain quantum mechanics here as it would need far more than a few paragraphs, but here's a quick sketch: the math model for quantum events is a probabilistic one: the underlying wave function evolves, but all it predicts is a probability density function. A measurement must "collapse the wave" and cause one of the choices to become real and all the other possibilities to vanish. One model of how this works has a special thing called an "observer" which can cause a collapse. Humans are observers, atoms aren't (this is the "Copenhagen interpretation" of quantum mechanics; there are others). The whole point of the "Schrödinger's Cat Experiment" is that maybe a cat is an observer, too.

So imagine a tiny Universe forms and its wave function evolves over time. The wave function includes all possible histories for a Universe.

Most of them aren't very interesting, but one of the very low probability futures for it is to become a Universe like ours, with stars and biology and dinosaurs. After a sufficient amount of time, the Universe has a non-zero probability of having an observer in it, and Bingo! The observer observes, and by the Weak Anthropic Principle must observe a Universe which permits observers. So the Weak Principle implies the Strong one.

I personally think this comes out of a deep misunderstanding of what quantum mechanics is, but I'm not a physicist, and there are a number of serious physicists who have published books along these lines – and along lines of argument even more weird. Weird is expected with quantum mechanics, so that's not an argument against them: as Richard Feynman said, "I think it is safe to say that no one understands quantum mechanics."

Conclusion

At this point you have to stop and take a breath. Are the "Anthropic Principles" speculations at the edges of science or some kind of logical toy? Is this something that might lead to real science or just people telling themselves a pleasing story with plausible hand-waving?

We do want to know why there is anything at all, and it's not impossible that someday we could find out why. To get to the point where we can do science on that topic we first have to do wild speculation; that's where we are today, and it's kind of exciting.

✶John Bishop

NHAS August 2009 Business Meeting

There were no volunteers to take minutes in the absence of the club Secretary. **Rich DeMidio** was absent, so Vice President **Mike Townsend** presided.

We had two guests at the meeting who came to us after seeing NHAS at the last Discovery Center sky watch.

YFOS

Larry Lopez reported that **Steve Forbes** has been keeping the grass under control at YFOS. Our thanks to him and his mower.

Public Observing

Marc Stowbridge reminded members of the upcoming sky watch at Dunstable on the 19th. Other sky watches are in the works, so keep an eye on the club calendar.

Educational Outreach

Matt Amar reported on recent activity regarding updating the website. Also, he presented the committee's ideas regarding sidewalk astronomy and more NHAS activities in conjunction with the McAuliffe-Shepard Discovery Center. He also presented a scope recently donated to NHAS.

Astrophotography

No report.

Webmaster

No report.

Membership

Bill Steele is starting to schedule the fall Astronomy 101 courses for the membership.

Book of the Month

None.

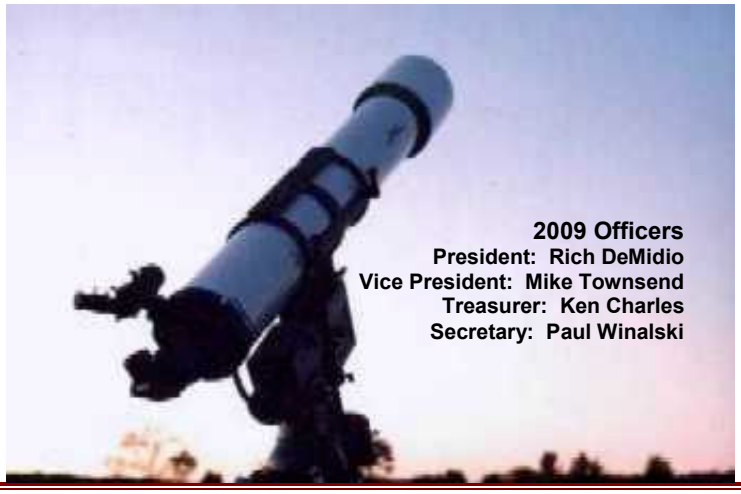
Scope of the Month

T+S 127mm F7.5 APO triplet refractor, presented by **Mike Townsend**.

Evening Program

Larry Lopez gave a talk about his recent trip to China to view the total solar eclipse.

✶ Mike Townsend



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NHAS
P.O. Box 5823
Manchester, NH 03108-5823
Attn: Treasurer

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info@nhastro.com

Use our web site:
http://www.nhastro.com/

This month's contributors:
Rich DeMidio, Dave McDonald, Scott McCartney, Ted Blank, John Bishop, Mike Townsend

New Hampshire Astronomical Society
P.O. Box 5823
Manchester, NH 03108-5823

NHAS Upcoming Events

Event	Date	Time	Location
NHAS Business Meeting	September 11	7:30 PM	St. Anselm College, Manchester NH
Westford Girl Scout Sky Watch	September 12	7:00 PM	Westford Girl Scout Encampment, Pelham NH
Coffee House Night	September 18	5:00 PM	YFOS
Fall Messier Marathon	September 18-19	6:00 PM	Scott Wickett's, Lyndeborough NH
Weeks Public Library Sky Watch	September 25	6:30 PM	Weeks Public Library, Greenland NH
Dunstable Town Library Sky Watch	September 25	7:00 PM	Dunstable Town Common, Dunstable MA
Discovery Center Public Sky Watch	October 2	7:00 PM	McAuliffe-Shepard Discovery Center, Concord NH
NHAS Business Meeting	October 16	7:30 PM	McAuliffe-Shepard Discovery Center, Concord NH
Coffee House Night	October 23	5:00 PM	YFOS
Reeds Ferry School Sky Watch	October 27	6:00 PM	Reeds Ferry School, Merrimack, NH
Discovery Center Public Sky Watch	November 6	7:00 PM	McAuliffe-Shepard Discovery Center, Concord NH
NHAS Business Meeting	November 13	7:30 PM	St. Anselm College, Manchester NH