

[For my December 2011 diary, go here.](#)

Diary — January 2012

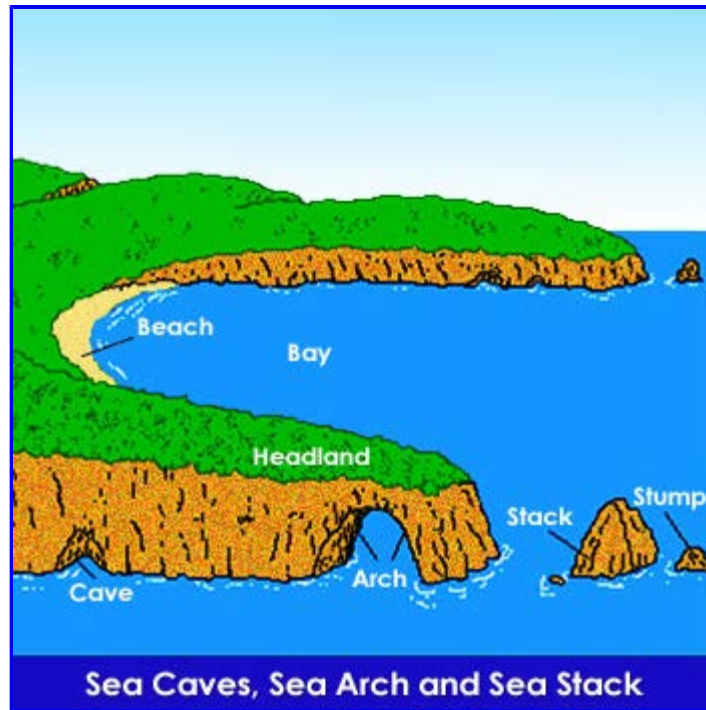
John Baez

January 1, 2012



Here's [Durdle Door](#), a sea arch on the wonderfully named [Jurassic Coast](#) in Dorset, England. This coast has cliffs made of limestone from the Triassic, Jurassic and Cretaceous periods, documenting 180 million years of geological history.

I showed you some awesome sea stacks at the top of my [August](#) and [September](#) diaries, and sea arches come from sea stacks — but how does this work? This picture helps explain it:



When a thin peninsula with cliffs erodes, caves can form. When these caves punch all the way through, we get sea arches. When these arches collapse, we get sea stacks. And when those erode, we get sad little stumps.

But Sampo Syreeni asks:

How did the peninsula get as thin as to start the process in the first place? Generally speaking one would expect it to erode away via unrelated processes, before this kind of thing should take place.

In the case of Durdle Door, [Wikipedia](#) offers information that doesn't quite answer the question, at least not for me. But maybe someone who knows more geology can figure it out:

The arch has formed on a concordant coastline where bands of rock run parallel to the shoreline. Here the rock strata are nearly vertical, and the bands of rock are quite narrow. Originally a band of resistant Portland limestone ran along the shore, the same band which can be seen one mile down the coast forming the narrow entrance to Lulworth Cove. Behind this is a 400-foot (120 m) band of weaker rocks which are easily eroded, and behind this is a stronger and much thicker band of chalk, which forms the Purbeck Hills.

The limestone and chalk are much closer together here than at Swanage, 10 miles (16 km) to the east, where the distance between them is over 2 miles (3 km). There are at least three reasons for this. First, the beds are highly inclined here, and more gently angled at Swanage. Secondly, some of the beds have been cut out by faulting at Durdle Door; and thirdly, the area around Durdle Door appears to have been unusually shallow, so a much thinner sequence of sediments were deposited here. At Durdle Bay all except a short stretch of the limestone has been completely eroded away by the sea and the remainder forms a small headland where it has protected the clay behind.

But why does some limestone poke out into the sea? A [concordant coastline](#) is one where bands of different kinds of rock run parallel to the sea; I'd naively expect a protrusion in a [discordant coastline](#), where they run at right angles to the sea.

January 8, 2012



Wow! I just learned about a pioneer in electronic music named [Daphne Oram](#), shown here working on a technology called Oramics, which she introduced in 1962... before anything like the Moog existed.

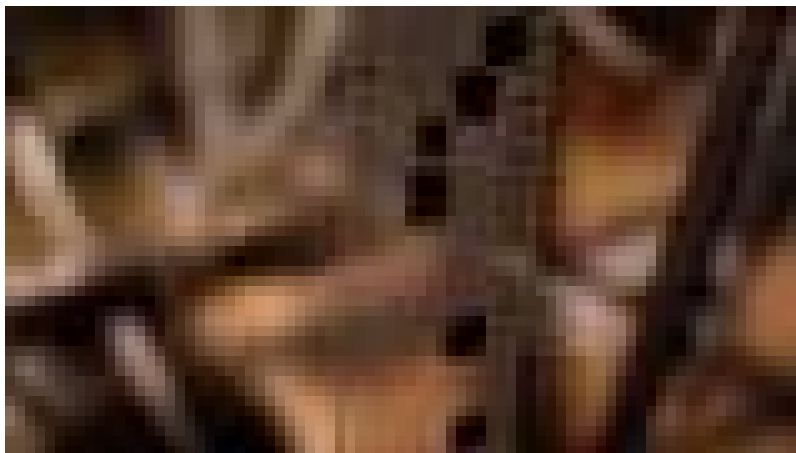
It's a table with graph paper on it. Curves are drawn freehand onto this paper and then copied with paintbrush onto 10 transparent, sprocketed loops of 35mm film. To create music, you run the film over photocells illuminated by a steady stream of light. The 10 loops then individually control different parameters of the sound. You can also control the speed at which the film moves using a clutch and gears!

Here you can see an album of pieces she made:

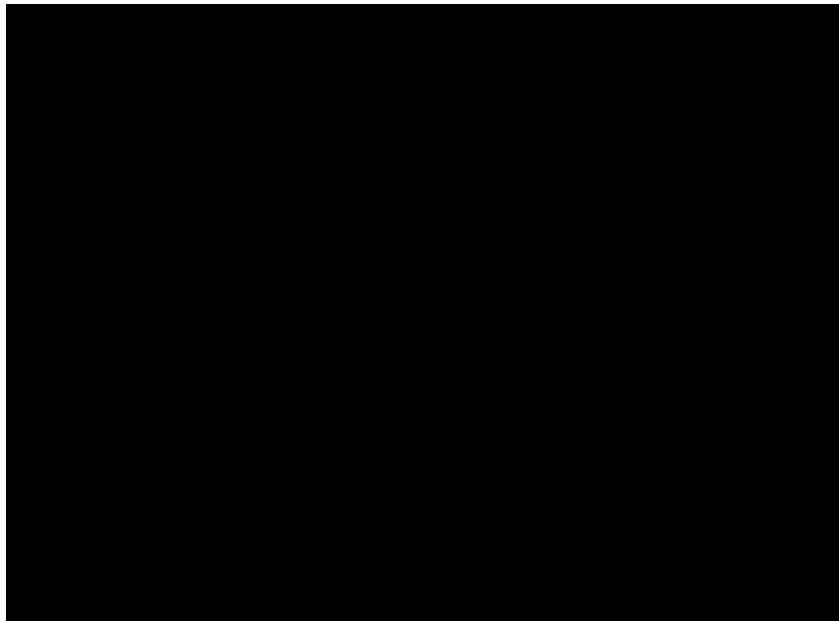
- Paradigm Discs, [Daphne Oram — Oramics](#).

and download some free samples. Only bother to do this if you like far-out electronic music and are interested in what someone could do back in 1962. Personally, I was impressed!

Daphne Oram joined the BBC at the age of 17 back in 1942, and "badgered the company endlessly to start investing in electronic music", spending many nights at their studios splicing tapes and building machines. Eventually this led to the BBC Radiophonic Workshop, which began in 1958 — but she only worked there until 1959, because she got sick of her music serving as background to TV shows.



This is a video by [Nick Street](#) about a museum exhibit called [Oramics to Electronica](#). The background music is all by her! This exhibit is running at The Science Museum in South Kensington, London, until December 1st, 2012.



You can't tell a book by its cover. Click the video above and listen. I would never have expected that the perky, conventional-looking woman here made this utterly deranged tune. From its sound, it should have been made by an experimental LA punk band! I find that delightful.

It's called "Snow" because it was "used to illustrate the poor performance of trains in cold weather". (Maybe it was a sound track?) It starts with some slow, atmospheric, industrial-sounding percussion. As it slowly accelerates, it starts becoming clear that it's a loop of a drummer — in fact Sandy Nelson, a star from the early 60s. After a while some electric guitar enters, a bit like a surf music. It keeps picking up speed, eventually becoming quite frenetic... and it ends with a crash.

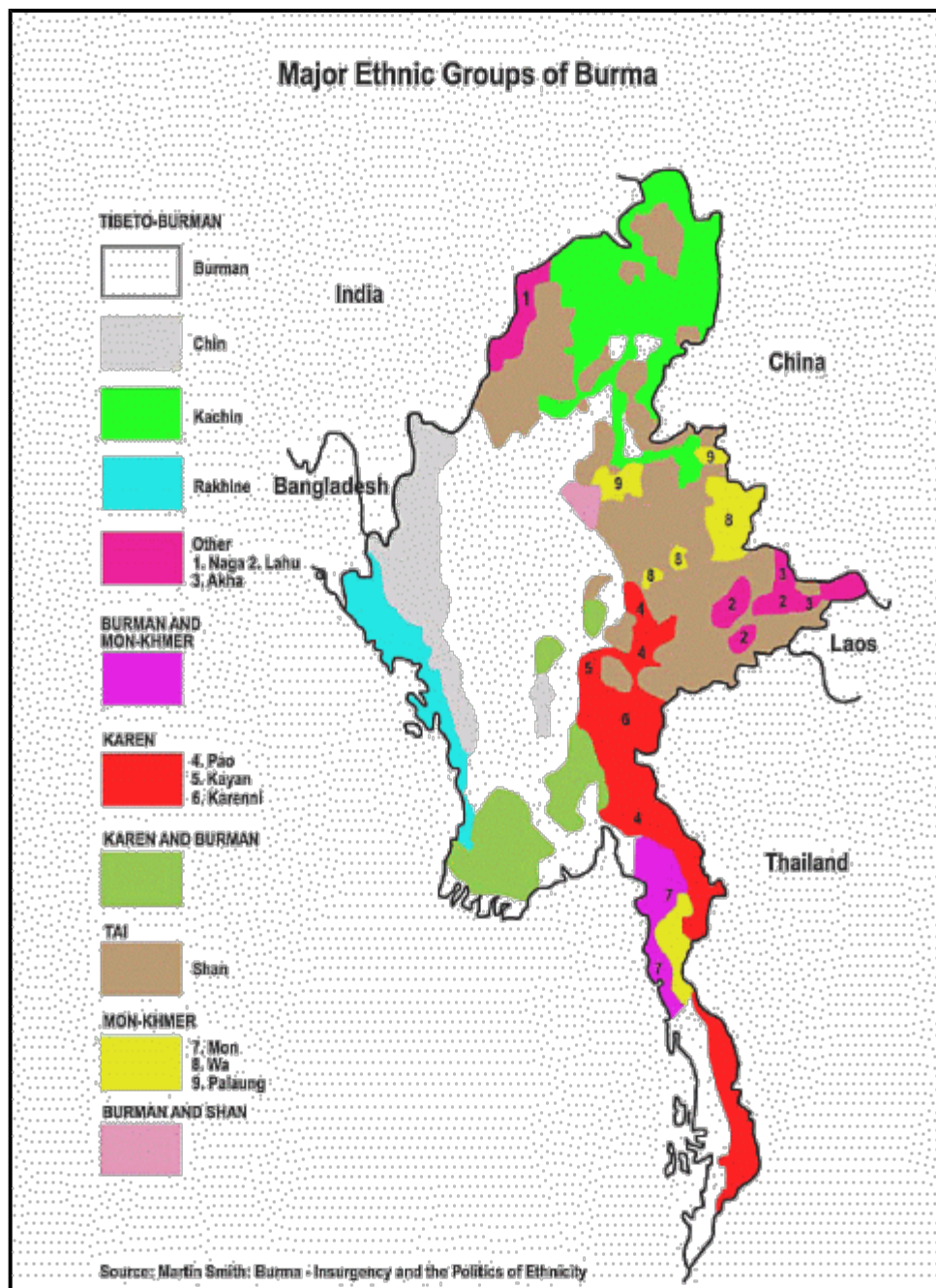
January 13, 2012

Good news! The government of Myanmar and the rebel army of the ethnic group called the [Karen](#) have [signed a ceasefire](#). The Karen never got an autonomous region like the other major groups in Myanmar, and a rebellion has been going on for over 60 years. The Myanmar army has been carrying out a campaign of 'ethnic cleansing', burning Karen villages, and about 160,000 have fled to refugee camps across the border in Thailand. Now maybe this will end.

I care about this more now that I've been seeing firsthand how the diverse peoples of Southeast Asia are being yanked abruptly and into the modern world. The woman who cleans our house, Phaw Phaw, is a Karen from Myanmar, now living in Singapore. In her village, they do the dance with poles shown below. We hope to visit it sometime this summer.



[Burma](#) began as a region conquered by the British Empire in a series of wars starting in 1832. They considered it a province of British India. After the Japanese invaded and were then defeated in 1948, it became a country — but there are still roughly 30 rebel armies in Burma, representing various ethnic groups! In short, it's a hugely diverse region with the misfortune of being a single country, [Myanmar](#), ruled by a nasty government — together with a lot of armed people unwilling to put up with this.



About 65% of the people speak Burmese, white in the picture. This is a Tibeto-Burman language — and so are the Chin (grey), Kachin (green), Rakhine (aqua) and Naga, Lahu and Akha languages (all in burgundy).

The Karen speak three different languages: Pa'o, Kayan and Karenni (all in red). These are also considered Tibeto-Burman — but that's somewhat controversial, because unlike most of those languages, their sentences go subject-verb-object instead of subject-object-verb!

The Mon, Wa and Palaung languages (yellow and light purple) are from a wholly different family: the Austro-Asiatic languages.

Finally, the Shan language (shown in tan) is from a third wholly different group: the Tai-Kadai languages. These also include Thai and Lao.

This is a vast oversimplification, since there are about a hundred languages spoken in Burma! I'm just trying to wrap my head around the linguistic scene in southeast Asia. So, let me add that worldwide:

About 45 million people speak [Tibeto-Burman languages](#), mainly Burmese and Tibetan.

- About 80 million speak [Austro-Asiatic languages](#), mainly Vietnamese and Cambodian.
- About 80 million speak [Tai-Kadai languages](#), mainly Thai, Lao and Zhuang (in China).

January 22, 2012

It's New Year's Eve here in Singapore... the Year of the Dragon is coming! The stores which were so frantically selling huge amounts of snack food are mostly closed by now, and the next two days will be public holidays. Lisa and I are going downtown this evening to get some new door posters, have dinner, enjoy the crowds, and maybe see the fireworks.

Here's the Prime Minister, Lee Hsien Loong, helping kick off the festivities yesterday by tossing a coin into a lantern:



January 23, 2012

Last night Lisa and I went downtown to shop for some calligraphy to hang our door. The population of Singapore is largely Chinese, with a lot of Malays and Indians as well — but there's still a "Chinatown", a kind of epicenter of activity, and on New Year's Eve it becomes insanely crowded with people eager to shop, eat out, and eventually watch the fireworks. That's where we went.

Red is considered a lucky color in China: it's associated with courage, loyalty, honor, success, fortune, fertility, happiness, passion, and summertime. Chinatown becomes very red on New Year's Eve!



For Chinese, the biggest holiday is the Lunar New Year, or "Spring Festival." It's at least the equal of Christmas and New Year's Day combined in the United States... maybe with Thanksgiving thrown in on top! The festivities start on on the first day of the traditional Chinese lunisolar calendar, and end on the 15th day with the Lantern Festival.

It's customary in China to put posters with calligraphy on your door — and it's good to mark the new year with a new one. We got two saying

Going out and coming in, balance and peace.

Not one of these — but these were pretty too:



Lisa also wanted to renew our door poster saying "Spring". We couldn't find the calligrapher we used last time, but we found someone willing to make one for us:





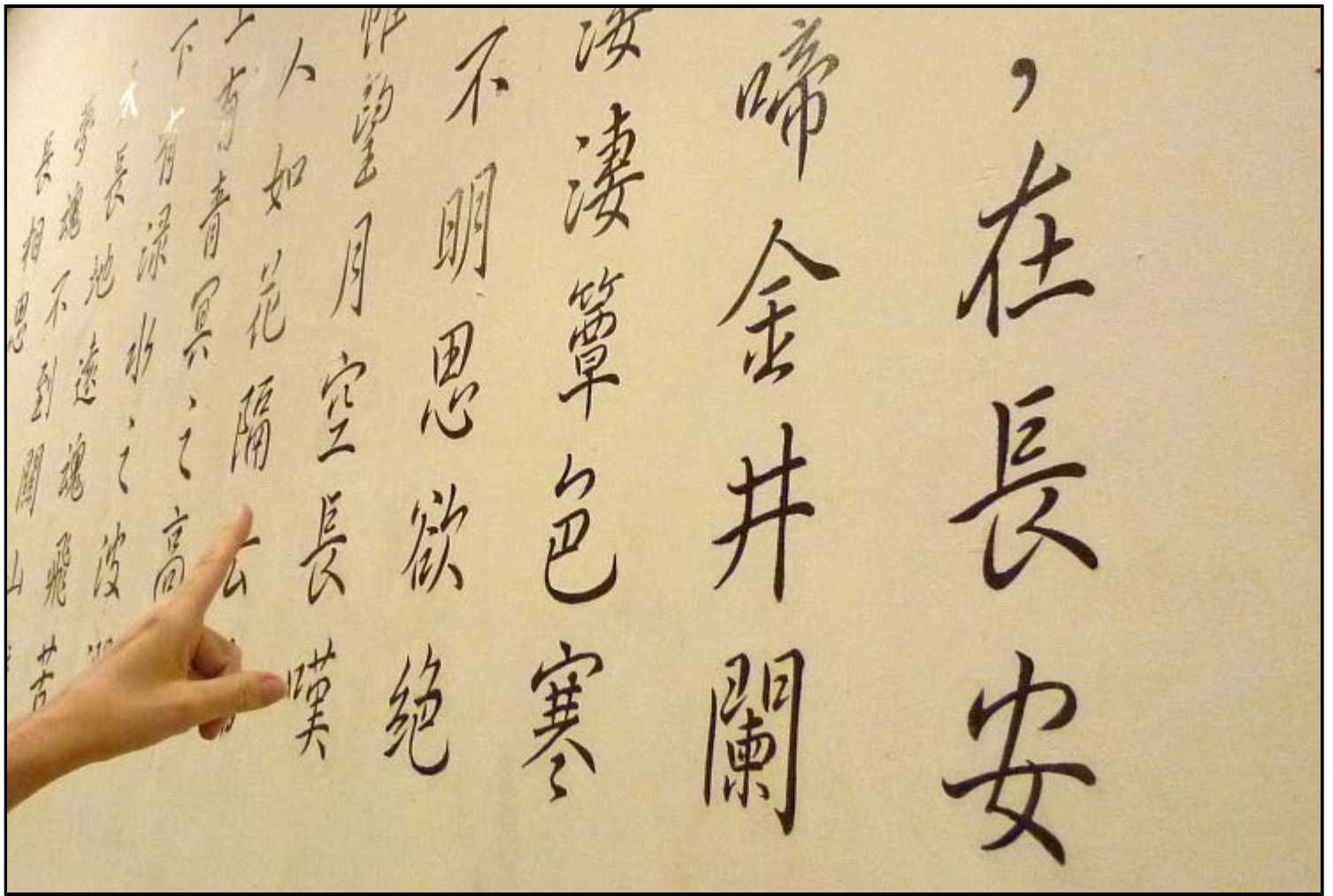


He used a blow drier on it before wrapping it up.

[Chinese calligraphy](#) is a marvelously subtle art, with many forms and a long history. I like it even though I can't read or write! One reason: even the finished, static product lets you feel the motion of the brush. Joan Stanley-Baker puts it well:

Calligraphy is sheer life experienced through energy in motion that is registered as traces on silk or paper, with time and rhythm in shifting space its main ingredients.

We finished up our New Year's Eve by doing what Singaporeans like to do best: *eat*. Smith Street is packed with restaurants and stalls selling food from all over: China, Malaysia, India, Thailand, Vietnam and more. And don't forget: saying "Chinese food" or "Indian food" is like saying "European food": these aren't single cuisines, they're *dozens!* We picked a [Xi'an](#) restaurant and had skewers of lamb, dumplings, and super-thick noodles in garlic chili sauce. By coincidence there was a poem by the famous Tang poet [Li Bai](#) on the wall, continuing the calligraphic theme of the evening:



The calligraphy here is pretty basic, so let's wrap up by looking at the work of a master. This is the only surviving calligraphy by Li Bai, also known as Li Po:



Born in 701 out in the wild west, he eventually found his way to the capital, Chang'an, where the emperor hired him as a translator. He died in 762. According to a popular but baseless legend, he drowned trying to embrace the reflection of the moon in the Yangtze River.

Poetry has been defined as "that which is lost in translation", and the tightly coiled patterns of classical Chinese poetry turn to mush in English, with the complex allusions and beautiful calligraphy lost as well. For example, Li Bai's famous poem "Visiting the Taoist priest Dai Tianshan but not finding him" rhymes in Chinese. Translating it word-for-word we get:

Dog bark water sound in
Peach blossom bring rain thick
Tree deep sometimes see deer
Stream noon not hear bell
Wild bamboo divide green mist
Fly spring hang green peak
Lack person know place go
Sad lean two three pines

Imposing English grammar dilutes this intense word-blast to:

A dog's bark amid the water's sound,
Peach blossom that's made thicker by the rain.
Deep in the trees, I sometimes see a deer,
And at the stream I hear no noonday bell.
Wild bamboo divides the green mist,
A flying spring hangs from the jasper peak.
No-one knows the place to which he's gone,
Sadly, I lean on two or three pines.

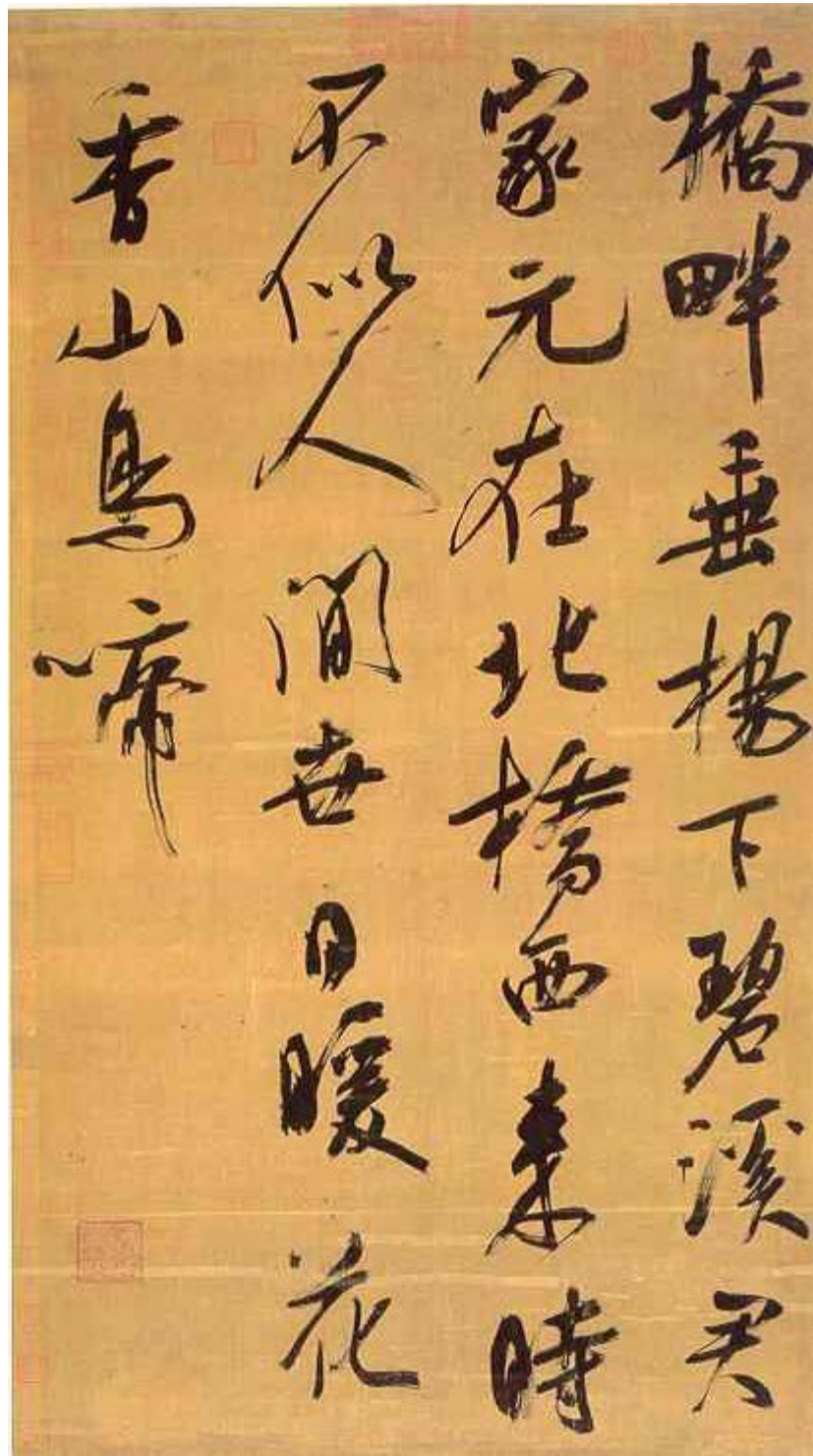
I got these from here:

- Mark Alexander, [Visiting the Taoist priest Dai Tianshan but not finding him](#), [Chinese Poems](#).

and there you can also see the same poem in traditional or simplified characters or pinyin, and many other poems as well.

For more Chinese calligraphy, see this:

- [Calligraphy of the masters](#), [China the Beautiful](#).



[For my February 2012 diary, go here.](#)

The writing stops but the meaning goes on; the brush has been put down but the power is unending. - Chinese saying

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Diary - February 2012

John Baez

February 1, 2012



This magnificent sea stack, called [Old Harry Rock](#), stands near the eastern end of the Jurassic Coast of England. This picture is from Dr. Ian West's webpage, which is packed with geological information about this area. For another amazing formation on the Jurassic Coast, see the top of my [January 2012](#) diary.

Next to Old Harry Rock is Old Harry's Wife, shown here:



Again this image is from [Dr. Ian West's webpage](#).

But who, you ask, is Old Harry? One legend says it was Harry Paye, an infamous pirate from Dorset who later became a commander, leading naval raids along the coast of France and Spain, burning two cities to the ground and taking many hostages. This legend says he stored his contraband nearby. But another legend says that the Devil himself (traditionally known euphemistically as "Old Harry") had a sleep among these rocks. Indeed, Old Harry Rock is also known as the Devil's Rock.



Above is a nice view of Old Harry's Rock, Old Harry's Wife and the cliff on the shoreline, known as St. Lucas' Leap. Why that name? In 1910, W. M. Hardy wrote:

It was close by, at St. Lucas's Leap, that a pair of pedigree greyhounds belonging to a certain squire at Studland, while coursing a hare, are said to have leaped clean over the cliff and have been dashed to pieces, the name St. Lucas being afterwards given to the spot where the tragedy occurred to commemorate the name of one of the favourite hounds which perished so suddenly and tragically. It was said that the old gentleman did not long survive the disaster, as he was so greatly attached to the dog and its fortunes.

More recently, in 2009, a dog chasing a rabbit ran off this 30-meter cliff, landed in the sea, and was rescued by the crew of a yacht that happened to be nearby! The breed of dog? Springer spaniel.

The above picture was taken by "Cmcqueen" and can be found [on the Wikipedia article](#) about the Old Harry Rocks. The anecdotes are from [Dr. Ian West's webpage](#).

Finally, here's a stunning view of Old Harry through a sea arch:



It looks like an abstract expressionist painting! I got it [here](#).

February 15, 2012



I've been avoiding long plane trips, but unable to resist getting to know the neighborhood while living here in Singapore. On Friday, Lisa and I are going to Chiang Mai for a week! That's the main city in northern Thailand. Bangkok, much bigger, is down south. Singapore is at the southern tip of Malaysia, not visible here. Luang Prabang, a town [we recently visited](#) in Laos, is not far from Chiang Mai. And indeed the Lao language is closely related to Thai, and some of the traditional architecture is similar. So it may be a bit familiar... though Thailand is much more prosperous.

February 16, 2012



I've been struggling to understand the history of Southeast Asia. Here's what it looked like around 1300 AD. Chiang Mai, the city I'll be visiting on Friday, was the capital of the [Kingdom of Lanna](#) — the purple region. Next to it, in orange, is the larger [Sukhothai Empire](#). East of that, in red, is the even larger [Khmer Empire](#), whose capital, Angkor, I've already taken you to: that's the city near the big lake. To the east of that is [Champa](#), a Hindu kingdom that covers much of what's now Vietnam. I saw some great statues from Champa when I visited the city of Huê in Vietnam.



I like the idea of staying in a city surrounded by a wall and a moat. Not that I'll feel safer... just sort of snug. Did you ever read Doris Lessing's novel [The Four-Gated City?](#) Well, the old city of Chiang Mai is square, with four main gates. Here's [Thapae Gate](#), on the east. Ever since 1300, the main route into this city has come from the Ping River down Tapae Road through this gate. By now Chiang Mai has expanded beyond its original walls, but this is still the main entrance to the old city.



In Chiang Mai we'll be staying on Ratchadamnoen Road. Every Sunday from 4 pm until midnight this road becomes a huge [Walking Street Market](#). Night markets are common in Asia — and this video, while not very professional, does a great job of conveying the feel of friendly chaos that makes these markets fun! They might seem scary at first, but everyone is completely laid back, so relax and explore: you might see a magician, or a stall selling puzzles of the Buddha, or quail eggs... you never know! I'm really going to miss these markets when I come back to the US. The shopping malls there are neat, clean, and deadly dull.

February 17, 2012

We flew to Chiang Mai and took a preliminary look around. Though it's the dry season, the city was shrouded in clouds...

The first things that jump out at you are the Buddhist temples, called [wats](#), and the many novice monks dressed in bright orange:



The wats are similar to the Lao ones shown in my [January 2012](#) diary entries, but subtly different in many ways. The [stupas](#) seem more prominent, for example — the stupa is the gold-tipped thing in back of the above photo — and they have a rich variety of sculpture:



However, as in Laos and Cambodia, Theravada Buddhism rests on an earlier layer of animist religion, so there are little [spirit houses](#) all over, especially in front of shops:



We went east on Ratchadamoen Road to Thapae Gate. Note the typical cloudy Chiang Mai sky:



There are in fact not just four gates to the city, but twelve. But most of these are now roads rather than actual gates, since in many places the original walls have crumbled and disappeared. Thapae Gate is the biggest actual gate, but the brickwork here looks new.

February 18, 2012

I'm becoming fascinated by the snake-like creatures called nāgas that guard many of the buildings in the wats here. According to [the Wikipedia article](#):

The Buddhist nāga generally has the form of a great cobra-like snake, usually with a single head but sometimes with many. At least some of the nāgas are capable of using magic powers to transform themselves into a human semblance. In Buddhist painting, the nāga is sometimes portrayed as a human being with a snake or dragon extending over his head. One nāga, in human form, attempted to become a monk; when telling it that such ordination was impossible, the Buddha told it how to ensure that it would be reborn a man, able to become a monk.

[...]

Nāgas are believed to both live on Mount Sumeru, among the other minor deities, and in various parts of the human-inhabited earth. Some of them are water-dwellers, living in streams or the mer; others are earth-dwellers, living in underground caverns.

I showed you some Lao nāgas in my [December 28, 2011](#) diary entry. They play a more prominent role as temple guardians here in Chiang Mai. Here are two at [Wat Prasat](#), a smaller wat behind the big and famous [Wat Phra Singh](#):



If you look carefully you can see the nāga is emerging from the jaws of another creature! See it? That's a makara!

Ubiquitous among the wat guardians is the mythical serpent, the *naga*. A denizen of the waters and the underworld, the *naga* appears on barge boards, eave brackets, and balustrades as well as on arches over gates, windows and doors. According to some legends, the *naga* can also take the form of a human.

On the balustrades, the *naga* often shares his role with the *makara*, a crocodilian creature whose open toothy jaws disgorge an irate *naga*. The *makara* head sometimes spouts an attenuated elephant trunk, and the neck is usually encircled by three ruffs.

That quote is from this nice little book:

- Carol Stratton, *What's What in a Wat: Thai Buddhist Temples*, Silkworm Books, Chiang Mai, Thailand, 2010.

For more, try this:

- Phan An Tu, [The signification of naga in Thai architectural and sculptural ornaments.](#)



The sign, while new, features the gate's name not only in Thai (on top) and English, but also in the [Lanna script](#) that was used here in the old days.

The [Saturday walking street market](#) starts at 4 pm on Wualai Road, south of the old part of Chiang Mai. It's less crowded and nicer than the famous Sunday market.

About 200 years ago, the [Tai Khoen](#) people living in what's now Burma were defeated by the Lanna Kingdom, whose capital was Chiang Mai. Many silversmiths, blacksmiths and stonemasons were captured and resettled in this part of town. Even now this area is famous for its silver shops. But the market features crafts of all kinds, as well as food and free live music!

Here's a bit of what we saw there:







February 19, 2012

In the morning Lis and I walked to the big, very active [Wat Phra Singh](#) at the west end of Ratchadamnoen Road. Every wat I know in Thailand has a [wihan](#), where lay people engage in ceremonies with the monks. The big wihan in in Wat Phra Singh is classic example of Lanna architecture: it's called Wian Lai Kham, and it was built in 1345. Here's a remarkable row of Buddha statues in the hall of this wihan, with banners blowing in the wind:



This makes me think of how our self has a model of itself, which has a model of itself, and so on. Elisabeth Schobus said it makes her think of how "the higher self, that is aware of all the lives it has endured, watches benignly all the lives still evolving". In Mahayana Buddhist temples one sometimes sees a row of three statues representing [Dipankara, Shakyamuni and Maitreya](#): the Buddhas of the past, present and future. But in Thailand the Buddhists are mostly Theravadan, and for them the only Buddha is the actual historical guy, as far as I know — though they do tell tales of his past lives. So, I don't understand the symbolism of this Buddha-row.

The gardens feature a Buddha amid tulips — quite unusual, it seems:



There are also two cute little nāgas in a pond:



In front of one building there's a much larger nāga emerging from the jaws of a makara:



There's a row of bells you can ring for good luck. They're fun to ring even if you're not superstitious:



Out back there's a garden full of signs with sayings on them. In *Citizens United v. Federal Election Commission*, the U.S. Supreme Court ruled that the right to free speech means corporations and unions can spend as much money as they want on political ads. This sign disagrees:



Then we went to [Wat Chedi Luang](#). This temple dates back to the 14th century, when King Saen Muang Ma of the Lanna Kingdom planned to bury the ashes of his father there. After 10 years of building it was left unfinished, later to be continued by the king's widow after his death. They too had a nāga emerging from the jaws of a makara:





I also saw a mom:



But don't ask "whose mom?" In Thai, "mom" is the name of a mythical aquatic creature with legs. This one looked rather bug-eyed and slow-witted: I thought it was just a kind of larval nāga. Later I saw some more energetic-looking ones.

But the high point of this wat is the enormous [stupa](#) out back. Every wat should have a stupa, which is a symbol of Mount Mehru, the center of the universe in Hindu (and then Buddhist) cosmology:





Note the huge stone nāgas at the base of the stupa, and of course the elephants above! There used to be lots of elephants in Thailand, and there are still quite a few.

In the afternoon we headed up to the northeast of the old city. We saw a coffee shop with a sign that raised more questions than it answered:



Is this for customers who are so tired they need a little nap before their coffee? Is it a bed and breakfast? Another sign, saying "spaghetti", only added to the mystery. There are lots of multifunctional places in Chiang Mai. Cafés where you can also get a massage are a dime a dozen. But it's also the first place I saw a combination laundromat and internet café. That seems like an obvious idea in retrospect! There are few things more dull than watching laundry spin around.

There are so many wats in Chiang Mai that we found a couple nice ones en route to our actual goal. For example, I saw some fiesty "moms" at [Wat Umong Maha Thera Chan](#):



But finally we reached our goal: the oldest wat in Chiang Mai! Called [Wat Chiang Man](#), this was built in 1297 AD on the spot that King Mangrai used a camp during the construction of his new capital city.

By this point it had cleared up, making it quite hot, but there was a beautiful blue sky to go along with the blue wihan of Wat Chiang Man:



More nāgas:







๖๓ พระกริ่งวัด บึงบัววัดสัมมาธิ์ ถาสาล่าพาดบนหลังของพญางูใหญ่ ได้เข้าอินตราจเพรา-เกรงศิษยะษาค
ถ้ำจินดา นางชัยภีรา ประเด็นถ้ำศรี หรือหมุดตราสน

The last picture is one of a series illustrating Buddhist tales; if you know Thai, please translate the caption and tell me what it says!

At 4 pm, Ratchamondoen Road became an enormous market: the [Sunday walking street market](#). When it got dark it became too crowded to be much fun, but it was nice at first. Thai street food is famous world-wide, and a detailed description would fill up all of this February diary — there are whole [websites on this subject](#) — so I won't even try!



February 20, 2012



This is a Taoist text, written in classical Chinese — one of several Lisa bought today. It's yet another trace of the complex history of this area. In the 1800's, the Yao people were driven from China down into Vietnam and the Thai and Lao highlands. More fled to Thailand after the Vietnam War, since they were on the losing side. The Yao are Taoists, and in their struggle to scrape out a existence they sold many of their books to Thai antique stores back in the 1980's.

Lisa got these books at Kesorn Arts at 154-156 Tha Pae Road. That's a busy street which heads east from the old city of Chiang Mai down to the Ping River. It's a very old road, probably dating back to the city's founding in 1296. Now it's lined with coffee shops, antique stores, and small businesses. Kesorn Arts definitely worth visiting if you like old stuff! The owner is knowledgeable and friendly.

February 22, 2012

Today we took a ride north out of the city, a bit closer to the [Golden Triangle](#), which is apparently a lot less dangerous now than in former times, as the Thais at least have cracked down on opium production, and a lot is now centered in Afghanistan.

First we went to Nam Tok Mae Sa, a picturesque park with a cascading stream. Then we went to the village of Samoeng, which wasn't picturesque at all... but they grow strawberries there, so we got some strawberries and strawberry juice. Then we stopped at [Baan Tong Luang](#), an "eco-agricultural hill tribes village".

"Hill tribes" is a generic name for the smaller ethnic groups in southeast Asia. They don't necessarily love living in the hills: that's just where they were pushed when more powerful groups took over the flatlands! The groups living in this village include [Yao](#), [Karen](#), [Hmong](#) and others. It's a bit of a "human zoo", not very nice — but some are refugees from Burma, and this existence is probably quite a bit nicer than a refugee camp. They do, after all, have running water, food, access to schools, and ways to earn a living.



I forgot my camera today, so Lisa took all the pictures — but the above photo of a Yao woman is from Wikipedia, taken by "rex pe". Lisa is interested in the Yao because they're Taoist. In my [February 20](#) diary entry, I showed you a Yao Taoist text.

February 23, 2012



Lisa had a bit of a cold so I did a bit of wandering on my own this afternoon. On Tha Pae Road I explored [Wat Bupparam](#). It has some amazingly energetic-looking scaly creatures called "moms" guarding the temple doors:





It also features a nice five-headed nāga, and makaras that double as stair rails:





February 24, 2012

Lisa and I returned to Singapore today. Last night we finally broke down and had a Thai massage... and realized we should have been doing it *every* night! It really rejuvenated me, removing a lot of stiffness that's been building up over the years.

There's a lot to say about this trip that I didn't say, and a lot to show you that I didn't show, but this will have to do for now! I should emphasize that while I've shown you lots of pretty pictures, Chiang Mai is, in parts, a gritty and bustling city, with some heavily trafficked streets and a fair amount of smog mixed with the mist. So if you go there, don't expect a romantic paradise.

It's still a wonderful place. When I arrived back in Singapore, it seemed a bit dull.

[For my March 2012 diary, go here.](#)

Among the legends relevant to the Buddha and the indigenous animist serpent cult, one can rarely find any story which describes the Buddha fighting against the Nagas as in the legends of Brahmanist mythology. It is significant that Buddhism peacefully chooses an associational path in harmony with the animist serpent cult, rather than imposes its victory on the indigenous belief system. - [Phan Anh Tu](#)

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Diary - March 2012

John Baez

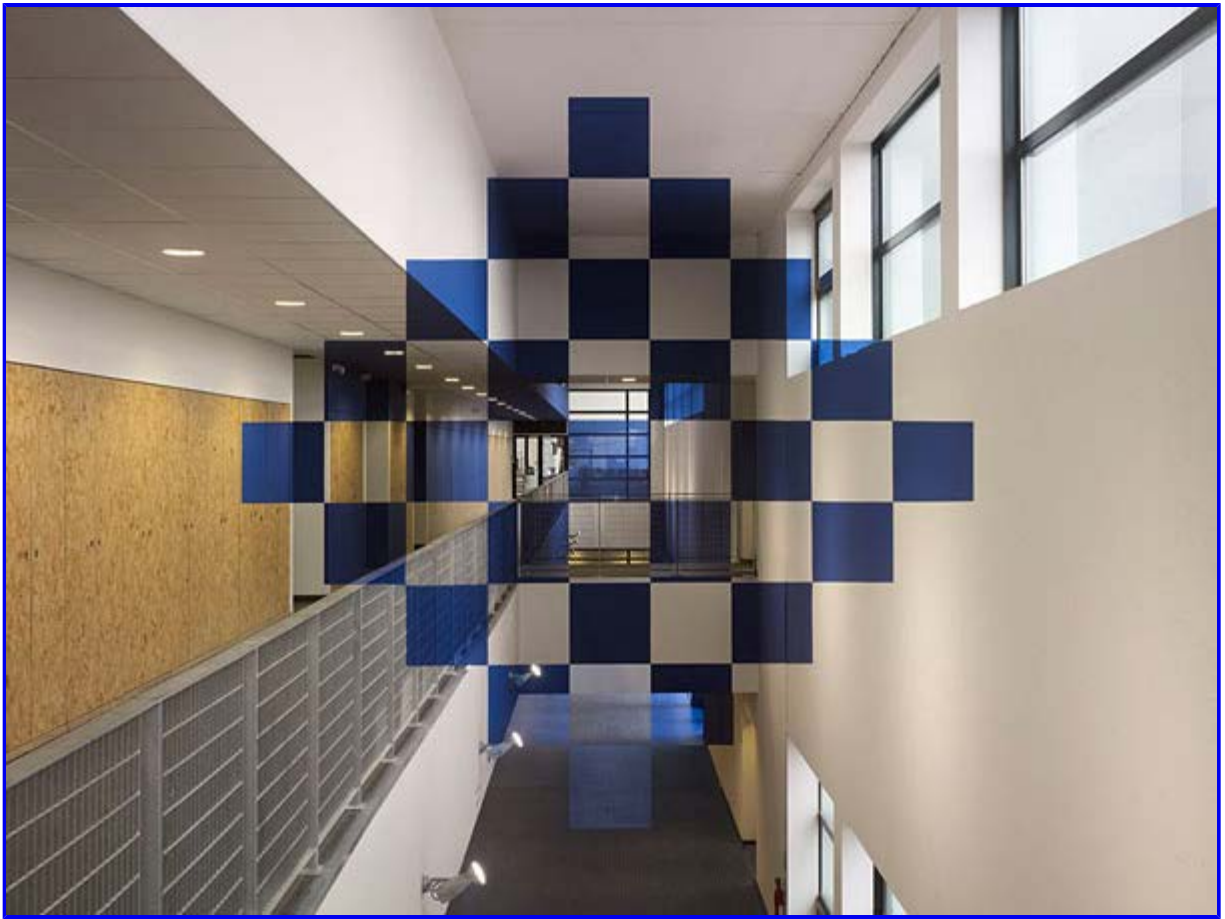
March 1, 2012



Once, in a Blue Moon...

Cytia Beata from Trondheim has taken a lot of photographs, and one she took on the ninth of February 2009 caught my eye. It was called "blue moon of deep night". I modified it considerably using some image-processing software and here's the result. A little collaborative art project!

March 6, 2012



This is not what it looks like. The blue squares have been *painted* on the walls, floor and window of this building! And they're not really squares: they only look square from this one very special point of view. If you don't believe me, go here:

- [Anamorphic illusions by Felice Varini](#), *Demilked*, February 15, 2012.

March 6, 2012



More fun art... but this *is* exactly what it looks like! It's a desk and chair built by the sculptor Giancarlo Neri. It's 9 meters high and built from 6 tons of steel and half a ton of wood. It was put here on the Hampstead Heath in London in June 2005, and moved back to Italy in October of that year. It's called [The Writer](#).

March 14, 2012



'Nothing' is hardly ever really *nothing*. Here is an 'empty' drawing by the famous abstract expressionist Robert

Rauschenberg. But there's a fascinating story behind it, and it caused a wave of shock in the New York art community, because of how it was made. And this story somehow *is* the drawing. Read the story here:

- Robert Krulwich, [Two ways to think about nothing](#), National Public Radio, March 13, 2012.

March 31, 2012



In 1965, in his studio in Warsaw, Roman Opalka began painting numbers from one to infinity. Starting in the top left-hand corner of the canvas and finishing at the bottom right, the tiny numbers were painted in rows. Each new canvas took up counting where the last left off.

There were slight changes as he went on. At first he painted white numbers on a black background. In 1968 he changed

to a gray background, and in 1972 he decided he would gradually lighten this gray background by adding 1 per cent more white to the ground with each passing detail. "My objective is to get up to the white on white and still be alive." He hoped this would happen at 7,777,777.

In July 2004, he reached 5.5 million.

The final number he painted was 5,607,249. He died on August 6, 2011 at the age of 79.

[For my April 2012 diary, go here.](#)

It seems that perfection is attained not when there is nothing more to add, but when there is nothing left to subtract. -
Antoine de Saint Exupéry

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baez@math.removethis.ucr.andthis.edu

[home](#)

[For my March 2012 diary, go here.](#)

Diary - April 2012

John Baez

April 1, 2012

1	i	j	k	l	li	lj	lk
i	-1	k	$-j$	$-li$	l	$-lk$	lj
j	$-k$	-1	i	$-lj$	lk	l	$-li$
k	j	$-i$	-1	$-lk$	$-lj$	li	l
l	li	lj	lk	1	i	j	k
li	$-l$	$-lk$	lj	$-i$	1	k	$-j$
lj	lk	$-l$	$-li$	$-j$	$-k$	1	i
lk	$-lj$	li	$-l$	$-k$	j	$-i$	1

My student John Huerta is visiting me in Singapore and we're writing a paper about a ball rolling on another ball without slipping or twisting. If the rolling ball is actually a spin-1/2 particle and the fixed one is actually a projective plane, the space of their possible positions is the same as the space of light rays seen by someone living in a 7-dimensional universe with 3 time dimensions and 4 space dimensions. And when one ball is exactly 3 times as big as the other, something even better happens! Then the whole problem has the same symmetries as the split octonions: an 8-dimensional number system whose multiplication table is shown above. Then the 7-dimensional universe consists of the 'imaginary' split octonions, those at right angles to the number 1.

The fun thing about math is that I'm not joking: this is actually all true. Honest.

April 5, 2012



When drum 'n' bass exploded onto the scene in the 90's, stripping dance music down to its minimal elements, one of the most intelligent practitioners was Rupert Parkes, aka [Photek](#). His music is atmospheric, jazzy, but a bit cold and often intensely rhythmic.





This, the title tune from his 1997 album *Modus Operandi*, is at the mellow end of his spectrum. It's 'music for staying up too late': the sort of thing you want in the airport cafe at 3 am when your connection is delayed.

At first it sounds like nothing is happening, but gradually you realize that about *nine different nothings* are happening: a simple jazzy drumbeat, an electronic piano lick, a deep bass line, a jazz guitar lick, various whooshing sounds to serve as transitions, a quiet steel drum pattern, a piano melody, a synth playing a string-like tone as a kind of drone — and way behind them, at the very brink of audibility, the sound of children playing in a schoolyard. Each is carefully chosen to be so cool in emotional tone that the music sounds like it's just waiting for its flight to show up. It's somewhere between soothing and unsettling.

April 6, 2012

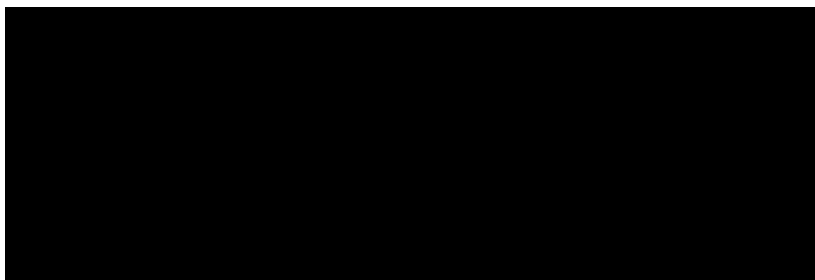
The title track of Photek's *Modus Operandi* is chilly late-night mood music, but the first few tracks form a chain of linked pieces that become increasingly energetic.



Track 1, "The Hidden Camera", starts with a deliberately cold and unpromising electronic piano riff: a ploy. Then comes a whoosh and the main characters appear: a double bass and a twitchy, jagged drum pattern poised between the catchy and the chaotic. To really enjoy Photek to the fullest, you have to listen to that pattern, get to know it, and try to mentally 'sing along with it'. Then you'll notice, for example, that around 2:25 he cleverly pulls the rug out from under you.

But more easy to appreciate are the elongated, dreamy synth lines that sweep like clouds over the rhythmic bed, making us attend to two very different time scales: the near-millisecond scale of the percussion, and the 10-second scale of these long notes. It's when our attention is saturated that music gets really pleasurable! Our brains like being used.

April 7, 2012





Track 3: "Minotaur". This is what I've been leading up to all along. True to its title, this piece sounds like a giant beast chasing you through an underground labyrinth!

It starts (and ends) with an off-putting raspy sound — you'll love it after the tenth listen. At 0:45 the first main character enters: a repetitive melody on very deep tuned drums. Though simple, it's unresolved enough, with enough empty space, to sustain the whole piece. But only at 1:51 does the tune reveal its full intentions: extra rhythmic elements, including distant blasts that remind me of titanic footsteps, fill in the missing spaces and give the piece a truly earth-shaking character.

The piece here ends abruptly, so if you like it, buy the whole album — *Modus Operandi* by Photek — and hear how it segues into the next one. The whole album is perfect for its kind.

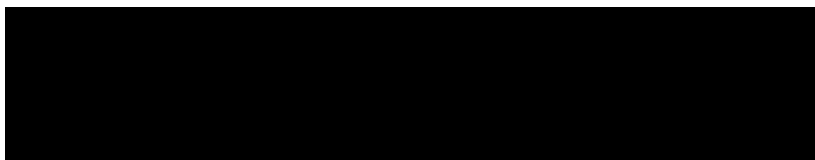
April 8, 2012



Since drum-n-bass music is often called "dnb", it made sense for Photek to title a piece "dna". It has a curious use of jazz guitar... and can you figure out what time signature this piece is in, or what's the underlying principle behind the strange, lumbering beat? I like fancy rhythms best when they swing and I can follow them in some rough intuitive way even though I can't rationally figure out what the pattern is. That makes me keep coming back for more.

This is off his 2000 LP *Terminus*.

April 10, 2012





A lot of Photek's old fans are disappointed with his new music, and it's easy to see why: while albums like *Modus Operandi* bristled with tense intelligence, some of his new stuff seems to fall back on dance music clichés. Take this piece, "Cecconi", from his 2011 *Aviator* EP. The chord sequence of the melody, and the way its timbre gradually shifts, is something we've all heard before. And the breaks at 1:09, where 5-note bits of that melody alternate with silence — that kind of stuff really tires me.

But wait... what rhythm is he using for the melody? I believe it's 11/4! At least, that's what I count during the parts where he's not shifting it around. Count yourself and see.

So I think he's decided to see what he can get away without us noticing. In a [2008 interview](#) he said:

I'm going to some amazing lengths and I've got an amazing guy who I am working with who is a visionary, Dr Henry Nicholas — an amazing scientist basically. I've been talking to him a lot about pioneering new ground. I've been reading a lot more than I've ever done; strategy, philosophy, neuroscience."

April 11, 2012



This 1997 piece is a classic of Photek's early, twitchy, aggressive style. It's also one of the few music videos on YouTube where the video actually helps. This piece is an intricate composition of drum, bass, and snippets of sound from Japanese martial arts movies - most notably, the clash of sword on sword. It's a truly *athletic* piece. In his [2008 interview](#), Photek said:

... the track "Ni-Ten-Ichi-Ryu" (Two Swords Technique) is literally a musical representation of the technique

of fighting with a long sword and a short sword. This is a technique created by Miyamoto Musashi . a Japanese historical samurai figure. I grew up doing martial arts before I got into music. Basically, my martial arts suffered from that (laughs), because I was just in the studio sitting in a chair clicking a mouse rather than out there training.

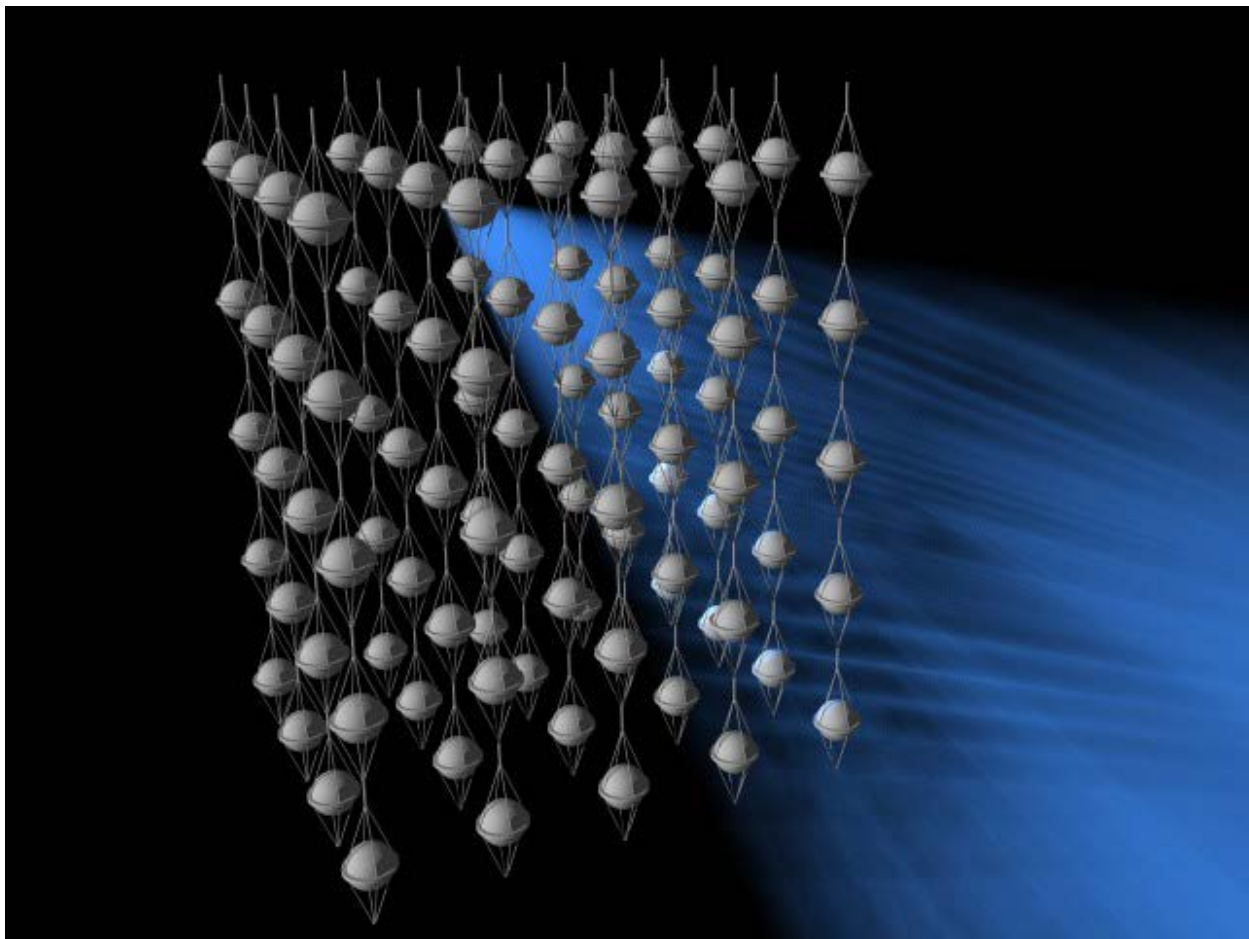
I completely disagree with the callous brutality embedded in the samurai philosophy, but single-mindedness, fearlessness and the ability to rally immense energy to the task at hand are qualities I'm always trying to cultivate. You can see the whole mixed package in Musashi's [The Book of Five Rings](#):

When we are fighting with the enemy, even when it can be seen that we can win on the surface with the benefit of the Way, if his spirit is not extinguished, he may be beaten superficially yet undefeated in spirit deep inside. With this principle of "penetrating the depths" we can destroy the enemy's spirit in its depths, demoralising him by quickly changing our spirit. This often occurs.

Penetrating the depths means penetrating with the long sword, penetrating with the body, and penetrating with the spirit. This cannot be understood in a generalisation.

Once we have crushed the enemy in the depths, there is no need to remain spirited. But otherwise we must remain spirited. If the enemy remains spirited it is difficult to crush him. You must train in penetrating the depths for large-scale strategy and also single combat.

April 24, 2012



[IceCube](#) is a neutrino detector built in the beautifully clear 18,000-year old ice deep beneath the Amundsen-Scott South Pole Station. When a high-energy neutrino hits a water molecule, sometimes the collision produces a muon zipping faster than the speed of light in ice. This in turn produces something like a sonic boom, but with light instead of sound. It's called Cerenkov radiation, and it's the blue light in the picture. This is detected by an array of 5000 photomultiplier tubes — those gadgets hanging on electrical cables.

One thing this artist's impression doesn't show is that IceCube is amazingly large. It's a cubic kilometer in size!

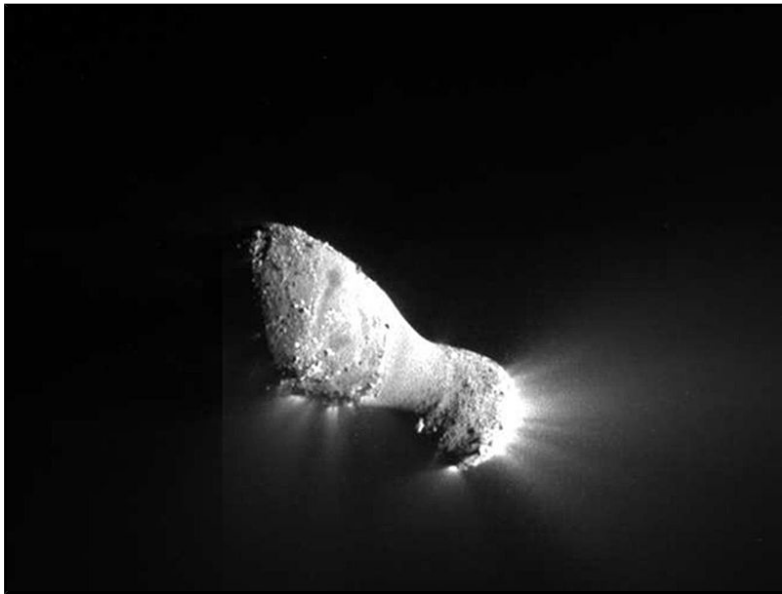


If you were a physicist you could work here! The South Pole Station has 200 people in the summer... but fewer than 50 in the winter. The station is completely self-sufficient then, powered by generators running on jet fuel. After the last flight leaves and the long dark begins, they show a double feature of *The Thing* (a horror film set in Antarctica) and *The Shining* (about an isolated hotel caretaker). They also have their own newspaper, [The Antarctic Sun](#).

Right now the big news is the discovery made by the IceCube neutrino detector. This lies deep beneath the snow: even its very top is 1.4 kilometers down, to minimize the effects of stray cosmic rays.

This Christmas saw a heat wave that set a [record high](#) temperature: -12.3 degrees Celsius! But by April 7 the temperature [dropped](#) below -100°F (-73 °C), less than three weeks after the one sunset of the year.

April 25, 2012



Here's the nucleus of [Comet Hartley 2](#), blasting carbon dioxide into space. This photo was taken by NASA's [EPOXI mission](#) in 2010. They were originally going to fly past a different comet, but amusingly when the time came, they couldn't *find* that comet! Luckily they could change plans in midflight.

This flight was also a test of the [Interplanetary Internet](#). According to Vince Cerf, celestial motion, planetary rotation, and delays from the speed of light all impair communication over distances on the scale of our solar system. Delay and Disruption Tolerant Networking solves these problems and seems to work better than TCP down here on Earth, too!

April 26, 2012

National Geographic has a [blog](#) written by people who are now climbing Mount Everest. Here's Sam Elias training in the [Khumbu Icefall](#) near the Everest Base Camp:



As usual, it's the Sherpas who impress me most:

Years of experience, or maybe the mountain itself, had told the Sherpas that passing through the Ballroom on this day was not a good idea, something would happen. "Big ice will fall." Panuru's words echoed in my head. "How do they know?" I wondered.

I was sitting in my tent fitting my crampons onto my boots when I heard it. I know the sound now. Before, when the loud rumbling began I instinctively thought of a giant semi barreling down a highway. But there are no vehicles here.

Also:

Every year, the route through the Khumbu is set by the "ice doctors," a small team of Sherpas who take mortal risks to navigate the safest passage through the Icefall, putting up ropes in the steep sections and stretching ladders across the abyss-like crevasses.

Crossing the ladders is an adventure for some. For the Sherpas, setting them up is a *job*.



Suppose you take the southeast route to Mount Everest, on the Nepal side. When you climb up from Base Camp, the first thing you'll hit is the [Khumbu Icefall](#), a crazy and ever-changing mass of ice at the bottom of the Khumbu Glacier:



As the *National Geographic* blog put it:

Like a gargantuan bulldozer, the Khumbu glacier plows down off the Lhotse Face between Mounts Everest and

Nuptse. Dropping over a cliff just above Base Camp, this mile-wide river of ice shatters into building-size blocks and steeple-size spires called [seracs](#). It's riven with cracks called [crevasses](#) that can be hundreds of feet deep. To reach our expedition's two goals — the Southeast Ridge and the West Ridge, which both begin atop the Khumbu glacier in the Western Cwm — we must travel up through this labyrinth of raging ice.

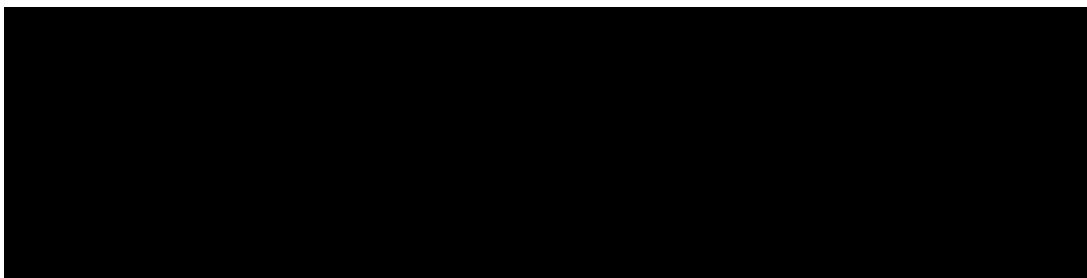
To cross the crevasses, you use bridges that the Sherpas have made by lashing ladders together with rope. Here's Nima Dorje Tamang crossing one. The clouds are like a ceiling... but there's no floor:



The picture above is again from [National Geographic](#).

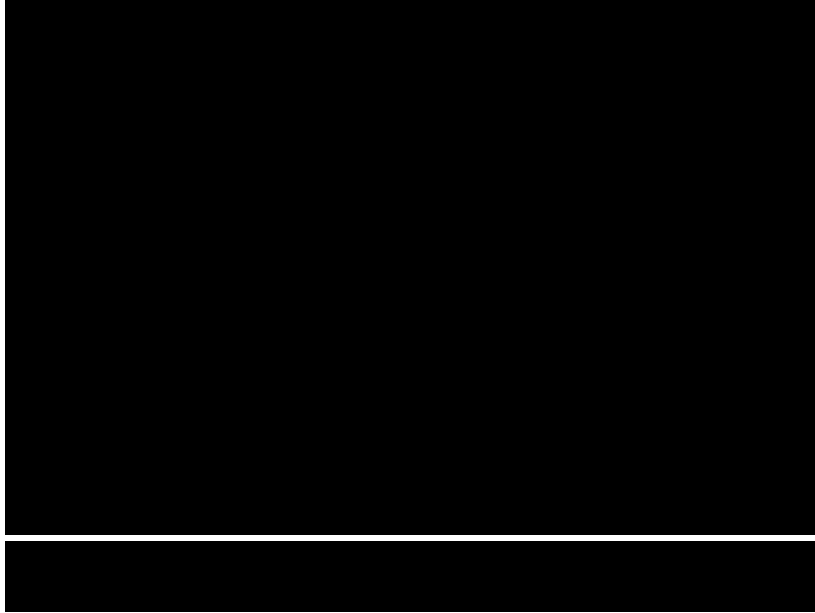
The glacier advances about a meter each day around here. Most climbers try to cross before the sun rises, when the cold keeps things frozen. As the intense sunlight warms things, the icefall becomes more dangerous. Blocks of ice tumble down the glacier from time to time, ranging in size from cars to houses... and sometimes entire large towers of ice collapse. They say bodies of people who die in here sometimes show up at the base of the icefall years later.

Here's Kenton Cool talking about the Khumbu Icefall. "It can implode underneath you, it can drop on you above — or god forbid, you can fall into its inner depths, never to be seen again."





And this is photographer Leo Dickinson speaking about the dangers of this place. Look at the fellow poking at snow with a pick around 0:58, revealing that it would be deadly to step there!



But suppose you succeed in crossing the Khumbu Icefall — including the last crevasse, shown in this photo by Olaf Rieck:



Then you have reached the [Western Cwm](#), also known as the Valley of Silence:



In the middle background is [Lhotse](#). At far right you see a bit of [Nuptse](#). And at left there's [Sāgārmatha](#), also known in Tibetan as Chomolungma... or in English, Mount Everest.

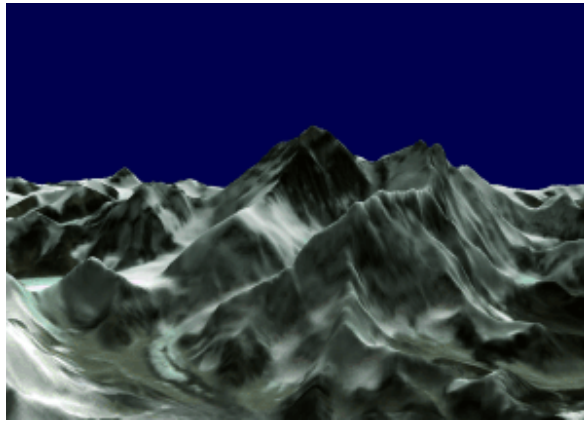
'Cwm', pronounced 'coom', is Welsh for a bowl shaped valley, also known as a 'cirque'. This one is a 4-kilometer-long valley carved out by the Khumbu Glacier, which starts at the base of Lhotse. It's the easiest way to approach Everest from the southeast. However, it's cut by massive crevasses that bar entrance to the upper part: here you must cross to the far right, over to the base of Nuptse, and through a narrow passageway known as the Nuptse corner.

It's called the Valley of Silence because it's often windless and deathly quiet. On days like that, the surrounding snow-covered slopes surrounding are so bright that the valley becomes a kind of solar oven, with temperatures soaring to 35 °C (95 °F) despite an elevation of 6000 to 6800 metres (19,600-22,300 feet). But when sun turns to shade, the temperature can plummet to below freezing in minutes!

The photo above was taken by the [Moving Mountains Trust](#). See the people? You may need to click for a bigger version! For more, see:

- Alan Arnette, [Life in the Western Cwm](#).

Want to go further? When you've reached Base Camp II near the top of the Western Cwm, you still have 2300 meters to climb... and now it gets *steep!* I'm sorry, I'm quitting here and heading back down — it's my bedtime. Good luck!



We can cut our carbon footprint if we travel virtually:

- [Mount Everest summit—interactive 360 degree panorama.](#)
- [Reality Maps viewer for Everest.](#)

Michael Murphy writes:

I had become intrigued by the story of Marco Siffredi, a French snowboarder who was the first to successfully descend Everest on a snowboard via the Norton Couloir. His second attempt to descend a far more serious route, the Hornbein Couloir ended in his demise.

Here's the video of him leaving the summit. I used Reality Maps to trace his route. It is no wonder he did not make it.



[For my May 2012 diary, go here.](#)

Most people find that as they walk above about 13,000 feet, something quite difficult to define changes in their consciousness - Hugh Swift

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[For my April 2012 diary, go here.](#)

Diary - May 2012

John Baez

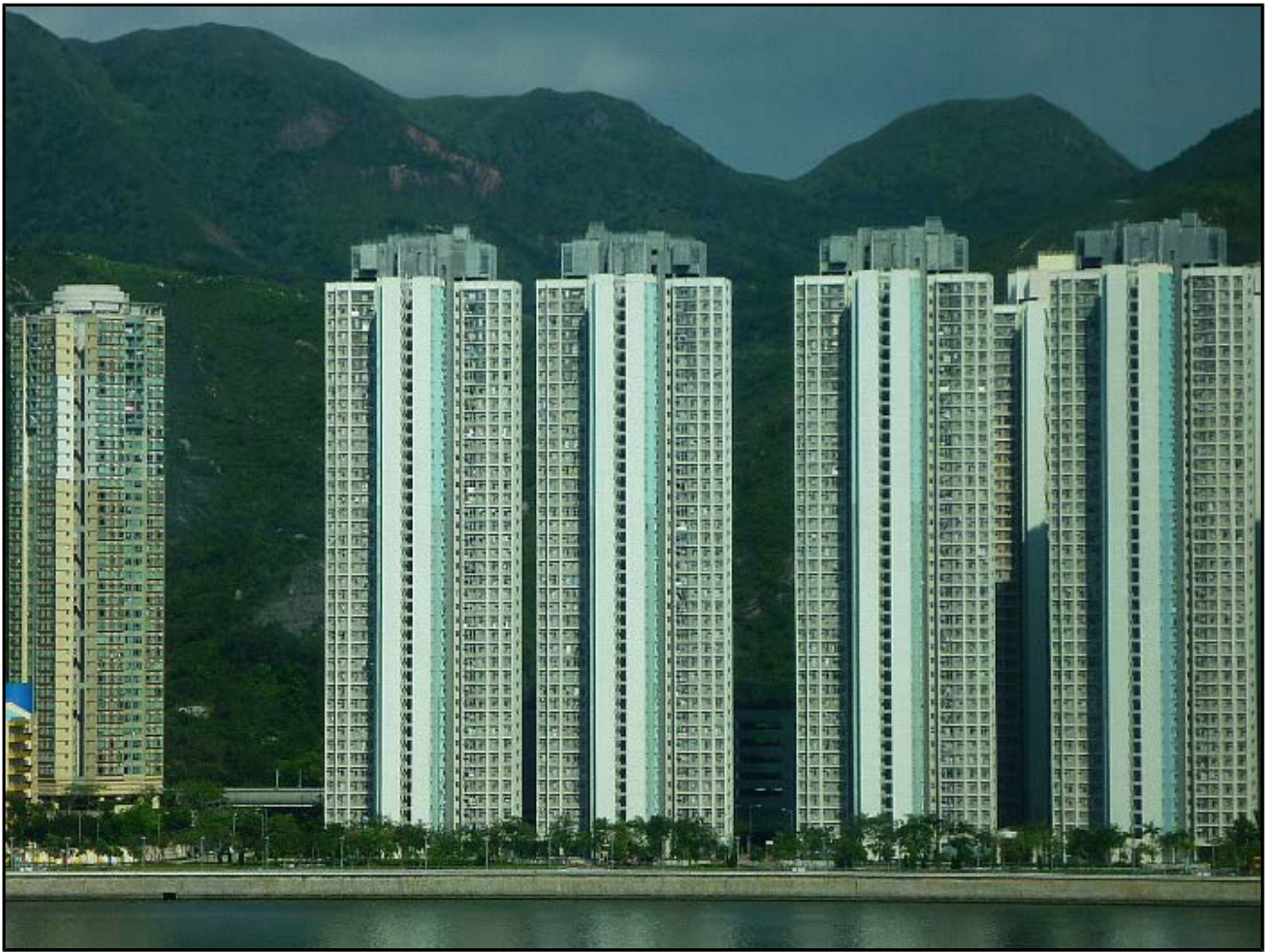
May 1, 2012



When you try to walk across a moonbow... be very careful!

This is a 30-second exposure of a lunar rainbow over Victoria Falls, with Orion in the background, taken from the Zambia side of the falls. It was taken by [Calvin Bradshaw](#), who kindly put it on Wiki Commons.

May 10, 2012



Hong Kong is a far-out mix of old and new, natural and artificial. Lisa and I are giving talks at universities here, and right now we're staying at hotel near Chinese University, which is up in the New Territories, fairly far north from downtown. Our window faces out to Tolo Harbour, and we can see that curious mix of tall apartments and wild mountains that's so common in Hong Kong, and so rare elsewhere.

May 11, 2012



After getting to Hong Kong yesterday, Lisa and I went to the [jade market](#) in Yau Ma Tei, which is a dense urban area in Kowloon, the peninsula across from Hong Kong Island. The woman she knew before spotted us before we saw her. We spent two hours carefully looking through all the pieces here, and bought a small carving of [Guanyin](#), good for a necklace. Time for Lisa's birthday present!

火
鍋
配
料
篇

牛皇新鮮豬雜類 *Pig*

豬肚尖 TRIPE	\$48
鮮豬腰 KIDNEY	\$28
豬粉腸 INTESTINES	\$28
豬潤 LIVER	\$28
豬心 HEART	\$28
豬肚 TRIPE	\$28
肉眼根 Eye Roots	\$35
豬紅 BLOOD	\$28
豬皮 SKIN	\$28
豬肺 LUNG	\$28
及第什錦拼盤 ASSORTED SET	\$68



及第什錦拼盤

Later Lisa and I walked south to Tsim Sha Tsui and had dinner. We did not eat here. These prices are in Hong Kong dollars, so they're not as bad as they look: divide by 8 to get US dollars. But it wasn't the price that put us off.

There's a famous joke about the characteristics of people in different parts of China, which goes like this:

A man from Beijing, a man from Shanghai and a man from Guangzhou were walking along when all of a sudden, out of the sky, came a flying saucer! It landed, the door popped open, and an alien stepped out.

The man from Beijing said: "You should let me talk to it first. We should find out who their leaders are, and put them in touch with the government."

The man from Shanghai said: "No, you should let me talk to it first. Maybe we can set up trade relations. Just think how profitable that could be!"

The man from Guangzhou said: "No, you should let me look at it. Maybe we can eat it!"

Guangzhou is in southern China, sort of near Hong Kong. It's in southern China that they eat all the most scary stuff.

May 12, 2012



Here's the gate of the [Tin Hau temple in Yau Ma Tei](#), a crowded and busy neighborhood in Kowloon, the peninsula across the harbor from Hong Kong Island. My wife Lisa took this photo.

Tin Hau, also known as Mazu, is the Chinese sea goddess who protects fishermen and sailors. There are temples to her all along the coast — and 60 of them in Hong Kong!

According to legend, Mazu started as an actual girl who wore red garments while standing on the shore to guide fishing boats home, even in the most dangerous storms. This part could even be true, since many Chinese gods are historical figures who gradually got 'promoted' after death, working their way up the ranks until they became gods.

Chinese religion is very syncretic, meaning that it freely combines elements from different sources. Both Buddhism and Taoism have borrowed popular deities from each other to attract devotees to their temples. In order to justify Mazu's presence in Buddhist temples, legends were circulated claiming that Mazu's parents prayed to Guanyin for a son — but Guanyin answered their prayers with the birth of yet another daughter. Guanyin, in case you're not keeping score, is a Chinese female version of Avalokiteśvara, an important male figure in Indian Buddhism. So the idea spread that Mazu was a reincarnation of Guanyin... so there are Buddhist as well as Taoist themes in Tin Hau temples... and there are statues of Mazu in other Buddhist and Taoist temples, too!



My wife Lisa took this photo of someone doing divination with [kau cim](#) sticks at the Tin Hau temple in the Yau Ma Tei neighborhood of Hong Kong.

Chinese attitudes toward religion are different from Western ones and a bit hard for me to grasp. For one thing, most Westerners aren't used to polytheism or religions where believing in a doctrine or creed is not at all the point. I bet some Chinese have trouble grasping Western religious ideas, too. There's recently been a big stir in Hong Kong because some legislators were filibustering — holding up the passage of a bill — for the first time. In the May 25 *South China Morning Post*, Lau Nai-keung wrote an editorial which begins:

In the Western mindset, filibustering is procedurally correct and therefore lawful. This is based on several thousand years of blind belief that law is ultimately traced to God, and therefore rules should be obeyed and abided by.

China, however, is a godless country, and multiple deities provide ethical role models. Laws are judged by whether they are consistent with common sense and are workable. Legality has no overriding authority, and in

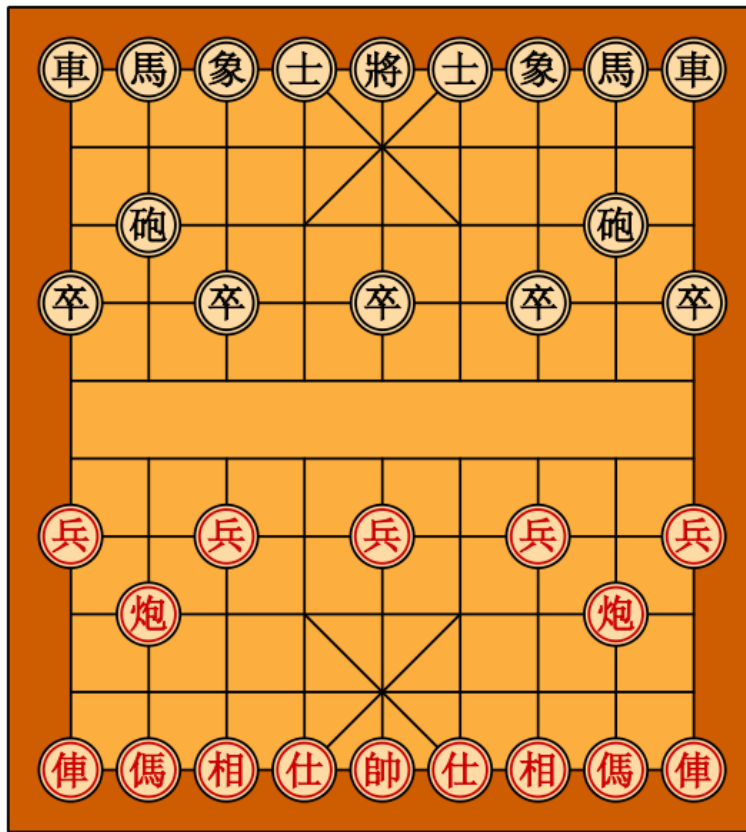
fact most Chinese believe that rules should be adaptable to changing conditions and not be rigidly fixed.

This description of Western beliefs rubs me the wrong way, and the idea that China is a 'godless country' with 'multiple deities' sounds odd. But I suspect this points at misunderstandings in both directions that are hard to correct.

May 13, 2012



Hong Kong is an intensely modern, commercial place — but there are also many patches of the old Hong Kong still visible. The Tin Hau temple in Yau Ma Tei also houses an altar dedicated to the city god Shing Won and the earth god To Tei, and there are fortune-tellers inside. Outside, there's a park where old folks sit around and — as usual — play cards and Chinese chess! They like it so much, it really makes me want to retire and take up a hobby like that.



Chinese chess, more properly known as [xiàngqí](#), is a very old game. Along with chess, it's from a family of games that appears to originate in India, but references to it date back to the Warring States Period, which ended with the beginning of the Qin Dynasty in 221 BC.

I know almost nothing about this game, alas! Each side has a general, two advisors, two elephants, two horses, two chariots, two cannons and five soldiers. Different pieces can move in different ways, and the goal is to capture the other side's general. A river runs across the board, and the elephants cannot cross this. So, it's akin to chess, but different.

The Wikipedia article on [game-tree complexity](#) says there are at most 10^{123} positions in the game tree for chess, but as many as 10^{150} for xiàngqí. For go, it says 10^{360} . I like the idea of go.



Hong Kong is the fourth most crowded country in the world. The Earth's land excluding Antarctica holds 50 people per square kilometer, but for Hong Kong it's about 6300. This is all the more impressive given how much of the land is forest-covered mountains. And [Kowloon](#), the area where this photo was taken, the density soars to 43,000.

Nonetheless there are lots of nice little parks in Hong Kong, like this one in Ya Mau Tei near the Tin Hau temple. And while Chinese chess is popular among men in these parks, card games attract much bigger crowds. What games do they play? I don't know. Do you?

Which countries beat out Hong Kong? Macau, Monaco, and then Singapore! Interestingly, they all have pretty famous casinos.



Hong Kong is full of brightly colored signs. At some point it goes past 'tacky' into a psychedelic realm all its own. If you've ever spent a lot of time out in the wilderness and suddenly returned to civilization, you'll know what a powerful effect these artificial colors have on us, though we quickly stop noticing. This is some street in Ya Mau Tei, the neighborhood with that charming temple I've been showing you. It's fun just to walk along and see all the strange things merchants are tempting you to buy.



As I walked through the gaudy streets of Ya Mau Tei, I saw lots of products that remained mysterious to me due to my

complete illiteracy. These look like fungi, dried fish and nuts of some sort. The shops selling traditional Chinese medicines are also full of strange substances. In the West we mainly hear about the use of endangered species like tigers, rhinoceri, black bears and the like... but there's also a cornucopia of medicinal plants and fungi, and these seem to predominate.

May 14, 2012



Both in Hong Kong and Singapore, [hell bank notes](#) are a popular form of spirit money. See this guy? I think he's the Jade Emperor, the king of heaven in religious Taoism... but the bills are often signed by Yanluo, King of Hell. Hell is not so bad in China: it's where we all go, and people down there (over there?) apparently need money just like us.

A good day for burning hell bank notes is [Qingming](#), or Tomb Sweeping Day, 15 days before the spring equinox. According to the Wikipedia article:

The Qingming Festival is an opportunity for celebrants to remember and honour their ancestors at grave sites. Young and old pray before the ancestors, sweep the tombs and offer food, tea, wine, chopsticks, joss paper accessories, and/or libations to the ancestors. The rites have a long tradition in Asia, especially among farmers. Some people carry willow branches with them on Qingming, or put willow branches on their gates and/or front doors. They believe that willow branches help ward off the evil spirit that wanders on Qingming.

On Qingming people go on family outings, start the spring plowing, sing, and dance. Qingming is also the time when young couples start courting. Another popular thing to do is to fly kites in the shapes of animals or characters from Chinese opera. Another common practice is to carry flowers instead of burning paper, incense or firecrackers.

I recently bought some hell bank notes in Singapore that looked more like American money. The figure is still the Jade Emperor, but under him it says 'Hamilton', just as on the \$10 bill. Peculiar!



May 15, 2012



Hong Kong Island is very hilly. So they built the [Central–Mid-levels escalators](#): the longest outdoor covered escalator system in the world. It takes you from the main downtown subway station up through the fashionable Mid-levels area, which is packed with restaurants, bars and fancy boutiques... but also little alleys and shops left over from the old days. The ride going up is 20 minutes. Down, you have to walk. Either way, it's a nice refuge from the rain: unlike Singapore, Hong Kong is not dominated by covered walkways.



Pick your incense! This little store in the Central district of Hong Kong Island has plenty of kinds. But see those stacks of paper at front left? That's spirit money, also known as ghost money or joss paper. In China and Vietnam, people burn it for their ancestors. According to the [Great Encyclopedia of All Knowledge](#):

The goal of ancestor worship is to ensure the ancestor's continued well-being and positive disposition towards the living and sometimes to ask for special favours or assistance. Rituals of ancestor worship most commonly consist of offerings to the deceased to provide for their welfare in the afterlife which is envisioned to be similar to the earthly life. The burning of spirit money enables the ancestor to purchase luxuries and necessities needed for a comfortable afterlife.

And as we'll see, it's not just money that get burnt: paper versions of all sort of modern luxury goods are also popular!

May 16, 2012



Here's a different side of Hong Kong: a view taken from near the western tip of the island. No fancy image processing — the sunset really looked like this! We were visiting some friends who work at the University of Hong Kong, and their apartment overlooks the West Lamma Channel. Despite the romantic lighting, Hong Kong is one of the world's busiest ports. Only Shanghai and Singapore [ship more containers](#). This is a big reason these cities are doing so well economically.

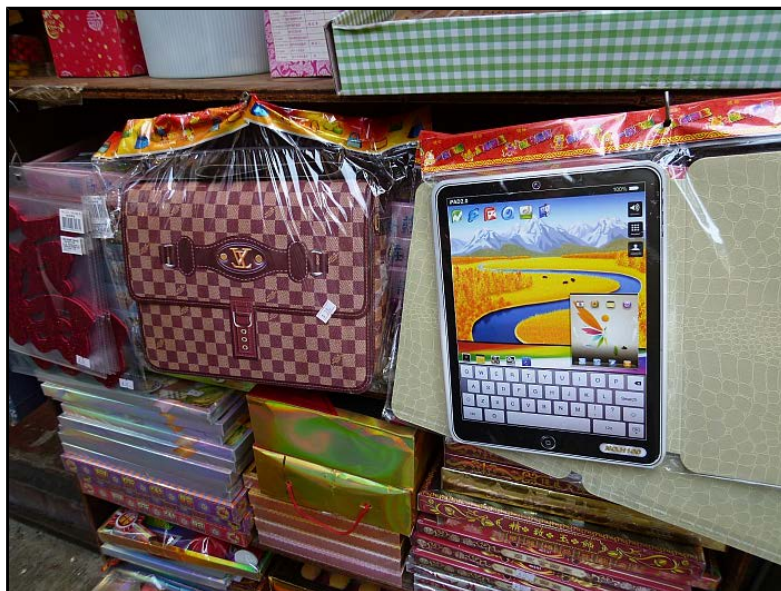


Looking in another direction we could see a big cemetery. The dead, like the living, are tightly packed in Hong Kong.

May 17, 2012



Lisa and I bought new laptops up in Wong Tai Sin, across the harbour from Hong Kong Island. We also wandered around a bit. Fans, incense, some golden Buddha statues... what else does this little shop provide? In red near the top you'll see the double happiness symbol, pronounced *shuangxi*, which is commonly used for New Year's decorations, weddings and similar occasions. And see all those red envelopes? These are called *hóngbao*. They're used for gifts of money on these occasions. The red color symbolizes good luck and is supposed to ward off evil spirits. There [might be something to this ...](#) or maybe not: this article reports on the long controversy over whether sports teams who wear red are more likely to win, and if so, whether this correlation is due to causation. Anyway, the Chinese use a lot of red.



You always suspected it, and now you know: they use Ipads in hell. This handsome model from a shop in Wong Tai Sin is made of paper, so you can burn it and have it ascend to your ancestors. There's an enormous range of paper goods like this: designer purses, shoes, and so on.

[For my June 2012 diary, go here.](#)

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[For my May 2012 diary, go here.](#)

Diary - June 2012

John Baez

June 1, 2012



There's something deeply appealing about greenery amid the desert — and it seems even more precious when it's a worrisomely tiny patch.

[A Crescent of Water Is Slowly Sinking Into the Desert](#)

Jim Yardley
New York Times
May 27, 2006

DUNHUANG, China, May 26 — At the bottom of the mountainous dunes once traversed by traders and pilgrims on the ancient Silk Road, Wang Qixiang stood with a camera draped around his neck. He was a modern-day pilgrim of sorts, a tourist.

He and his wife had traveled by train more than 2,000 miles from eastern China to the forbidding emptiness of the Gobi Desert to glimpse at a famous pool of water known as Crescent Lake. They came because the lake has been rapidly shrinking into the desert sand, and they feared it might soon disappear.

"It is a miracle of the desert," said Mr. Wang, 67.

In this desert oasis where East once met West and that is home to one of the world's greatest shrines to

Buddhism, the water is disappearing. Crescent Lake has dropped more than 25 feet in the last three decades while the underground water table elsewhere in the area has fallen by as much as 35 feet.

An ancient city that once served as China's gateway to the West, Dunhuang is now threatened by very modern demands. A dam built three decades ago to help local farming, combined with a doubling of the population, have overstressed a fragile desert hydrology that had been stable for thousands of years.

"I would call it an ecological crisis," said Zhang Mingquan, a professor at Lanzhou University who specializes in the region's hydrology. "The problem is the human impact. People are overusing the amount of water that the area can sustain."

Dunhuang is an old Silk Road city famous for the [Mogao caves](#), which contain Buddhist paintings and manuscripts:

Heaped up in layers, but without any order, there appeared in the dim light of the priest's little lamp a solid mass of manuscript bundles rising to a height of nearly ten feet, and filling, as subsequent measurement showed, close on 500 cubic feet. The area left clear within the room was just sufficient for two people to stand in - Aurel Stein, [Ruins of Desert Cathay](#), Volume II

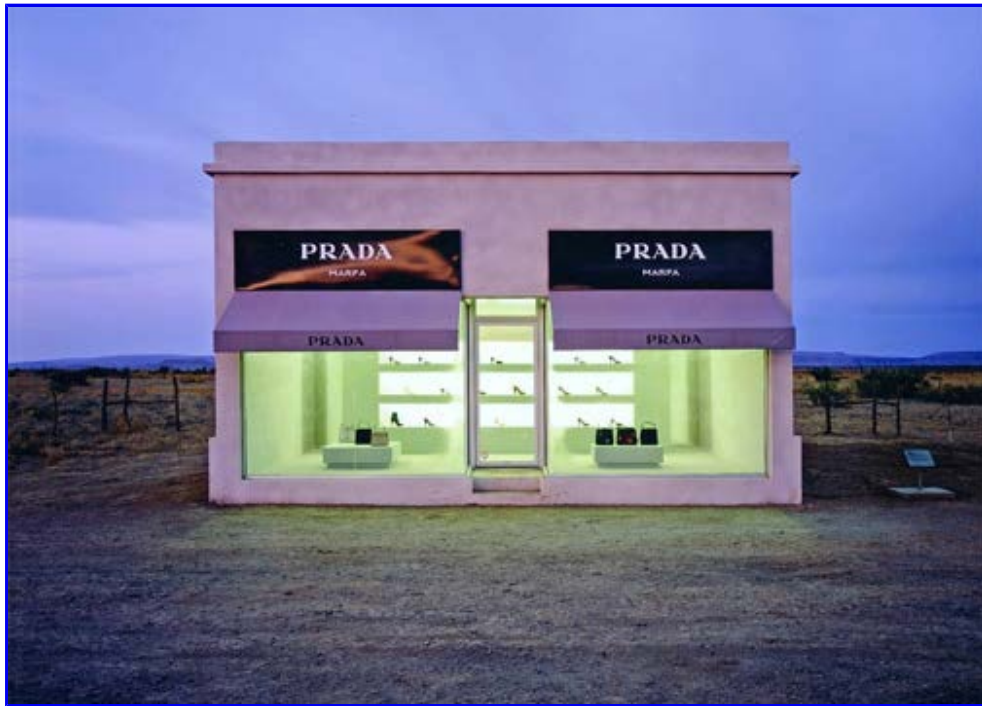
June 2, 2012



Erebus was the primordial Greek god of darkness: son of Chaos, husband of Nyx, the goddess of night, and father of Aether, Hypnos, and Thanatos. Here is his namesake, [Mount Erebus](#), glowing in the dark Antarctic winter. This volcano has been active at least since 1972, and contains one of the five longest-lived lava lakes on Earth.

June 6, 2012

Here's an abandoned Prada store near the small town of Valentine, Texas:



Actually it's a modern art installation, but I thought it was better to announce it as you're supposed to see it: a Prada store mysteriously sitting in the middle of nowhere, 1.4 miles northwest of Valentine, Texas.

It's called [Prada Marfa](#). Conceived by the art team Elmgreen and Dragset and realized with the help of architects Ronald Rael and Virginia San Fratello, it cost \$80,000 and was intended to never be repaired, so it would slowly fall apart and decay. But they changed their minds when, three days after the sculpture was completed, vandals broke in and stole handbags and shoes. Now it has security cameras!

This photo was taken by [Mina Bozovic](#).

[For my July 2012 diary, go here.](#)

Verily at the first Chaos came to be, but next wide-bosomed Earth, the ever-sure foundations of all the deathless ones who hold the peaks of snowy Olympus, and dim Tartarus in the depth of the wide-pathed Earth, and Eros, fairest among the deathless gods, who unnerves the limbs and overcomes the mind and wise counsels of all gods and all men within them. From Chaos came forth Erebus and black Night; but of Night were born Aether and Day, whom she conceived and bare from union in love with Erebus. - Hesiod, [Theogony](#)

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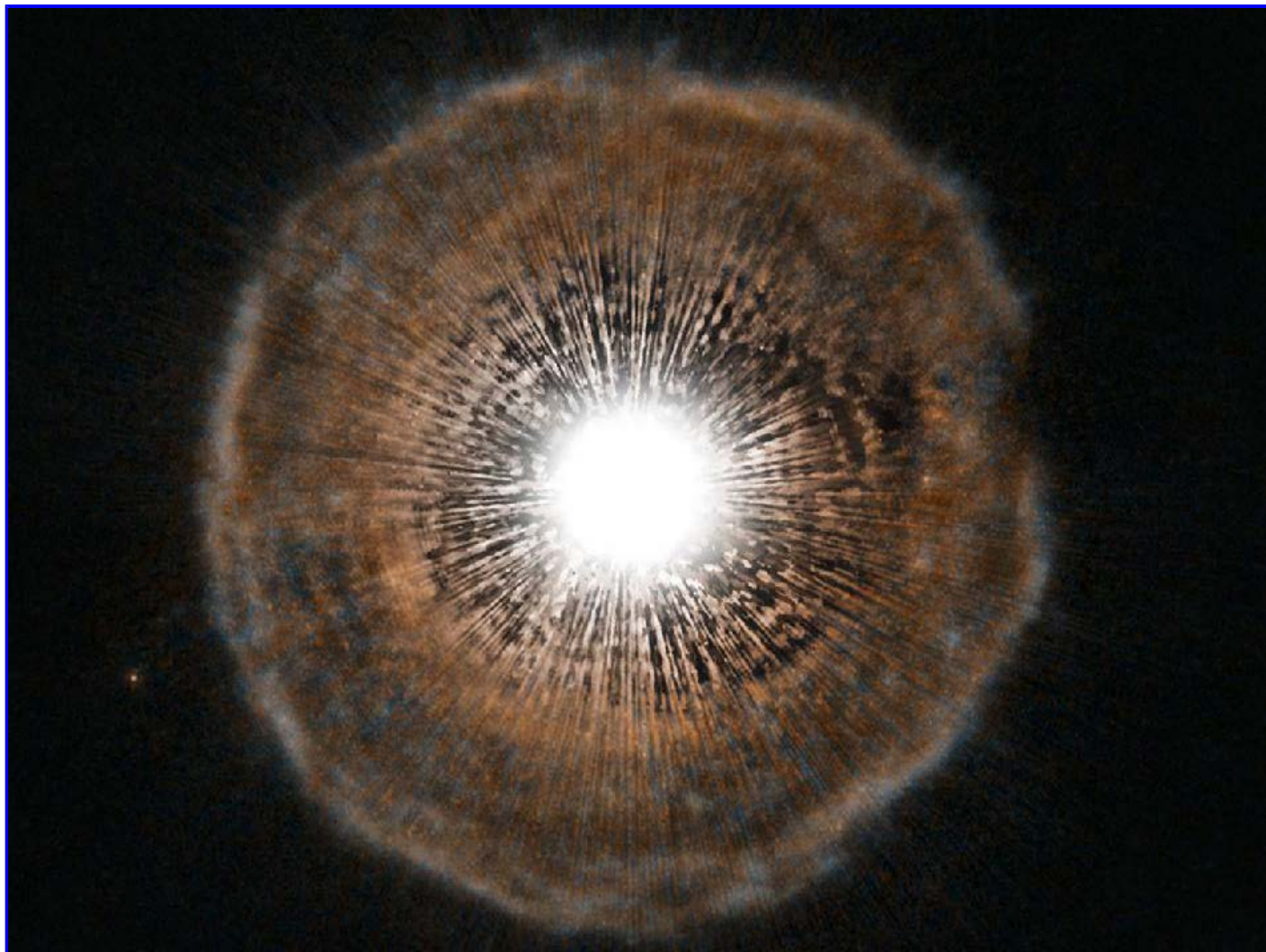
[home](#)

[For my June 2012 diary, go here.](#)

Diary - July 2012

John Baez

July 4, 2012



This red giant star, called U Camelopardalis, is 1500 light years away. Every few ten thousand years or so, a layer of helium surrounding its core gets compressed enough to undergo nuclear fusion. It does this abruptly, exploding in a [helium shell flash](#). When this happens, the star puffs out gas and dust, as shown here. Then the helium shell sinks back down... and eventually the cycle repeats itself.

The star itself is actually less than one pixel in size: it's just so bright that it overwhelmed the device used to make this picture. The cool-looking lines coming out of the star are also, sadly, just artifacts. But the sphere of dust is real. A lot of this stuff is carbon, so U Camelopardalis is called a carbon star.

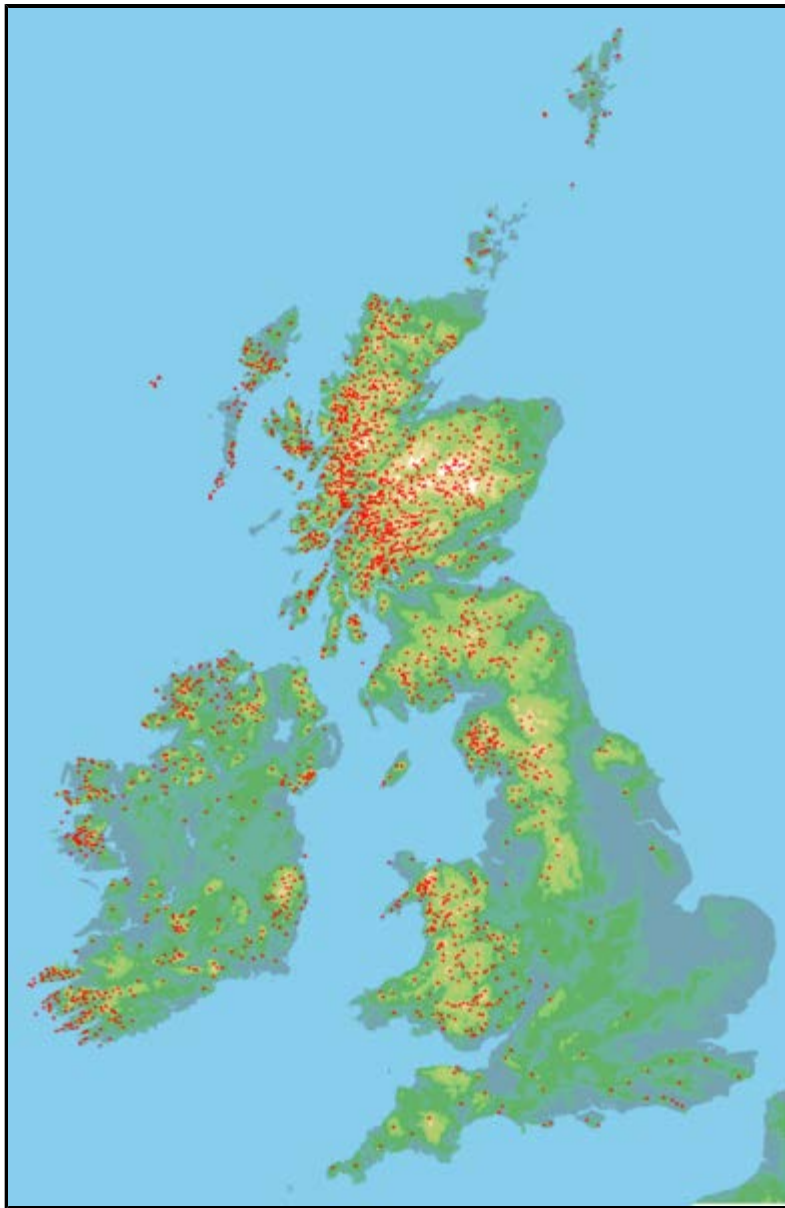
The picture is from [NASA](#). This paper has more details:

- H. Olofsson, M. Maercker, K. Eriksson, B. Gustafsson and F. Schvier, [High-resolution HST/ACS images of detached shells around carbon stars](#), *Astronomy and Astrophysics* **515** (2010), A27.

Until now, I thought all elements heavier than iron were made by supernovae. But now [I read](#):

Nucleosynthesis in He-shell flashes accounts for the production of about half of the heavy elements (above Fe) found on our planet. The nucleosynthesis products from the repeatedly exploding He-layer are convectively mixed into the outer layers of the star, from where they are blown off into space, ready to form new stars and planets.

July 9, 2012



How many hills are there in the British Isles? This is an ambiguous question, even after you decide how tall a 'hill' has to be. After all, what looks like one hill from afar might look like two or more when you're close. But the British love precision, so they've figured out a way to make this question precise.

First, don't count hills according to the height of the peak: that's hopeless. Count them according to prominence. A hill has prominence 10 meters, for example, if it's 10 meters taller than the lowest contour line that encircles it but no higher summit. Get it? Think about why this is more practical than counting hills by height!

Then, go ahead and count all hills (and mountains) with prominence greater than some arbitrary height... say, 150 meters.

In fact a 'Marilyn' is defined to be a mountain or hill in the United Kingdom, Republic of Ireland or Isle of Man with a prominence of at least 150 meters. This is something you can count. And indeed, there are 2,009 Marilyns, shown in the map above — and carefully tabulated in Alan Dawson's best-seller [The Relative Hills of Britain](#).

Puzzle: Why are Marilyns called 'Marilyns'?

Or if that's too hard:

Puzzle: What is the difference between the British Isles and 'the United Kingdom, Republic of Ireland and Isle of Man'?

July 10, 2012



Some Marilyns are harder to climb than others. Two of them are sea stacks: huge rocks jutting up from the ocean. They're called [Stac an Armin](#) and [Stac Lee](#). In his book [Relative Hills of Britain](#), Dawson writes:

These stacks will look absolutely frightening to most walkers. They have been climbed on several occasions, by some of the inhabitants of St Kilda before its evacuation in 1930, and by rock climbers since then, but there is no easy route up either of them. Even landing is a problem, as the stacks have no beach or cove, and calm seas are a rarity in this part of the world. Once on the stacks the multitude of seabirds on the narrow ledges are likely to pose an additional hazard.

The above picture of Stac an Armin makes it clear: this is not your typical hill! Its location makes it even harder to climb. Northwest of Scotland you'll find the Outer Hebrides, a bunch of islands with a reputation for being cold, windy and remote. Some of them are big. But further east you'll see a small archipelago called St. Kilda, whose population has been evacuated. It contains a tiny island called [Hirta](#), which is now a missile base. North of that you'll see an even tinier island called [Boreray](#), which is uninhabited. And northwest of that is Stac an Armin! To the southwest is Stac Lee.

You can see Stac Lee at the right in the picture above. Boreray is in the background, and Stac an Armin is the big thing in front.

For a great tale, with pictures, written by someone who climbed Boreray, try this:

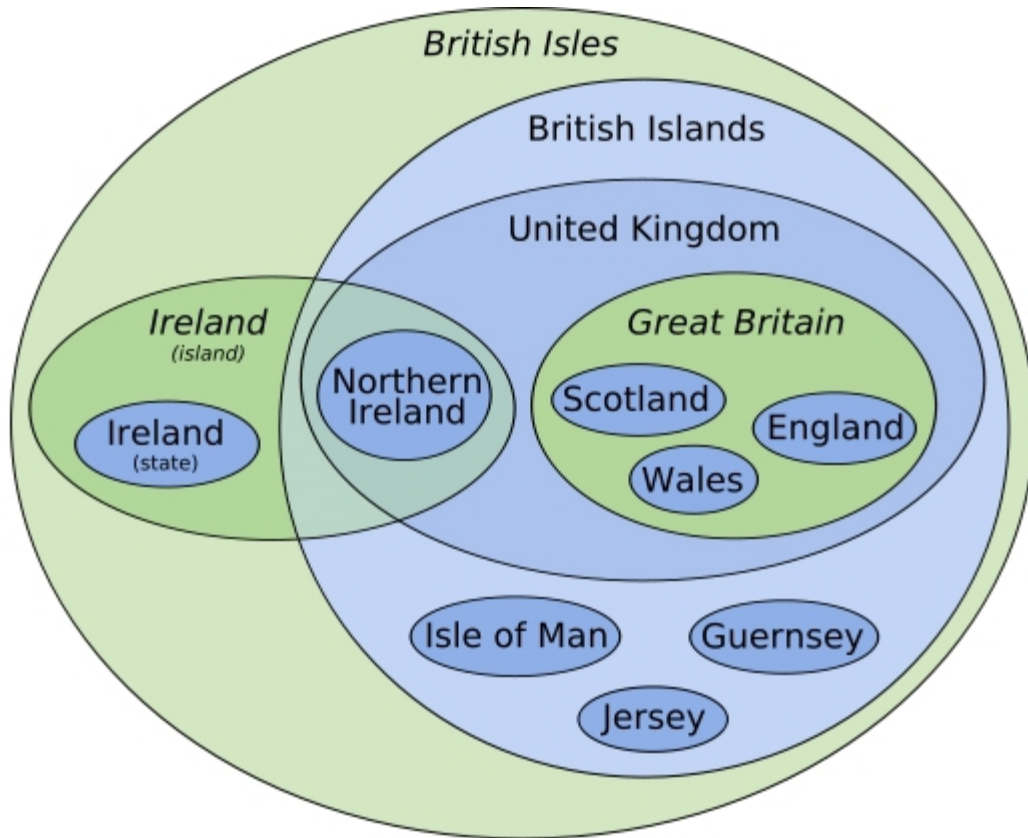
- Pete J. Kenny, [Boreray — St Kilda](#), November 27, 2009.

July 11, 2012

On [July 9th](#) I posed this puzzle:

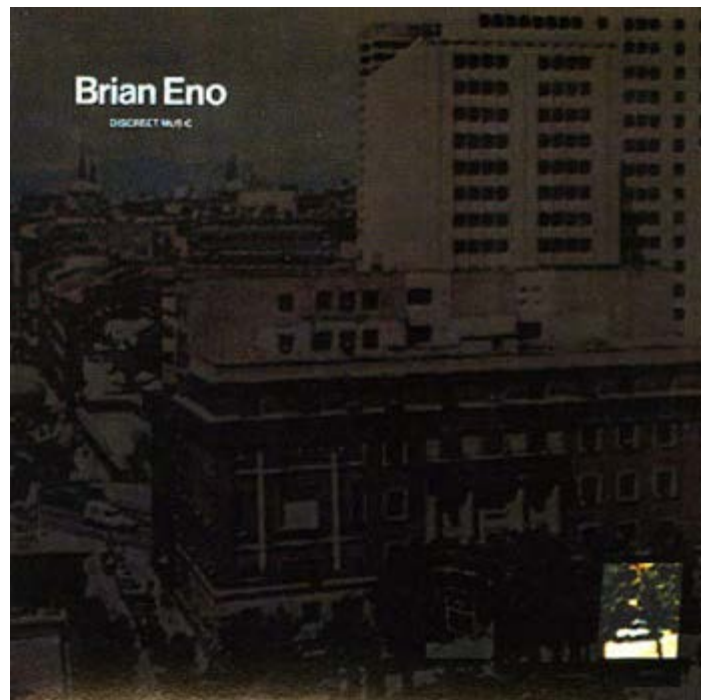
Puzzle: What is the difference between the British Isles and 'the United Kingdom, Republic of Ireland and Isle of Man'?

The answer is clear from this chart taken from [Wikipedia](#):



For years I found the definitions of all these concepts very confusing, and that's not even counting 'Britain' &mdsh; or the '[Commonwealth](#)', which now even includes Rwanda. Do all empires develop complicated Venn diagrams like this showing degrees of partial membership, or is it an especially British thing?

July 14, 2012



Wow! Brian Eno's first full-fledged ambient album, *Discreet Music*, is now [free online!](#)

Eno got the idea for this while lying in bed, recovering from being hit by a car. On the back cover, he wrote:

My friend Judy Nylon visited me and brought me a record of 18th century harp music. After she had gone, and with some considerable difficulty, I put on the record. Having laid down, I realized that the amplifier was set at an extremely low level, and that one channel of the stereo had failed completely. Since I hadn't the energy to get up and improve matters, the record played on almost inaudibly. This presented what was for me a new way of hearing music — as part of the ambience of the environment just as the color of the light and the sound of the rain were parts of that ambience.

As her name suggests, Judy Nylon was a punk rocker. It pleases me to know she'd give Eno some 18th century harp music.

The first side of the album *Discreet Music* was a 30-minute piece with the same name. It's wonderfully dreamy and peaceful, but it was made in a calculated way. It began with two melodic phrases of different lengths played back from a synthesizer — an EMS Synthi AKS — which had something that was unusual back in 1975: a built-in digital sequencer. This signal was then run through a graphic equalizer, which let Eno control the timbre. It was then run through an echo unit before being recorded onto a tape machine. The tape ran to the take-up reel of a second machine. The output of that machine was then fed back into the first tape machine, which recorded the overlapping signals.

The second half of the album was 'Three Variations on the Canon in D Major by Johann Pachelbel'. These pieces were performed by a string ensemble, conducted and co-arranged by Gavin Bryars. The members of the ensemble were each given brief excerpts from the score, which were repeated several times, along with instructions to gradually alter the tempo and other elements of the composition. The titles of these pieces were derived from inaccurate translations of the French liner notes on a version of Pachelbel's canon performed by the orchestra of Jean Francois Paillard.

1. In 'Fullness of Wind' the piece starts out sounding familiar, but then falls apart, very elegantly, into a blur of sound, with recognizable portions occasionally re-emerging and then dissolving again. This piece features effects and processing by Brian Eno. This is my favorite of the three.
2. In 'French Catalogues' notes and melodies of similar tempos are gathered into blocks from different parts of the score.
3. 'Brutal Ardour' has a plaintive, haunted sound... I don't know the principle behind it.

Some of my information here is paraphrased from the [Wikipedia article](#), but I don't trust their description of the three Pachelbel pieces. so I changed those. For some amusement, look at the 'genre' label on the mp3 files of these pieces. For more music, try other albums on the same label, [now free online](#).

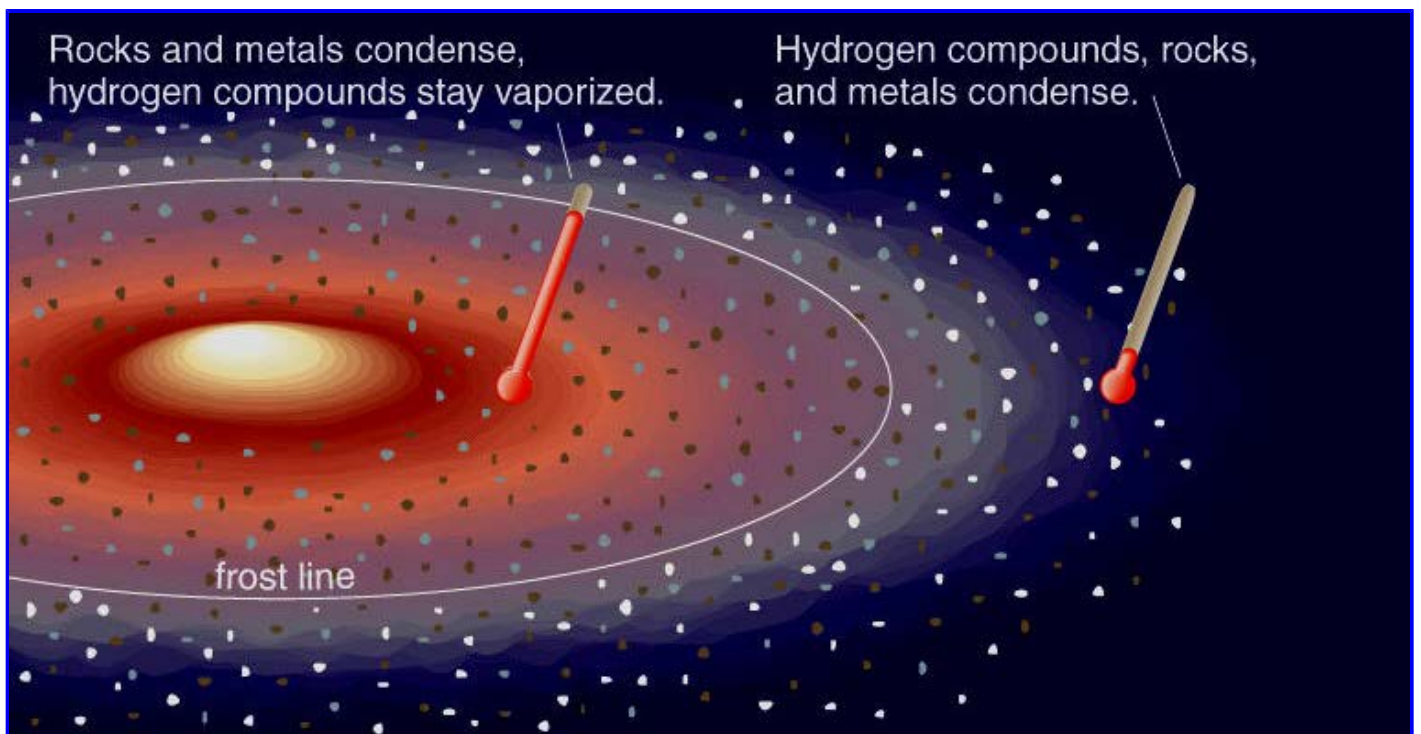
July 15, 2012

Many years later, as he faced the firing squad, Colonel Aureliano Buendía was to remember that distant afternoon when his father took him to discover ice. At that time Macondo was a village of twenty adobe houses, built on the bank of a river of clear water that ran along a bed of polished stones, which were white and enormous, like prehistoric eggs. The world was so recent that many things lacked names, and in order to indicate them it was necessary to point.

Thus, with an bang, begins *One Hundred Years of Solitude* by Gabriel Garcia Márquez. The first sentence is one of those cliffhangers that makes you read on... and it introduces the violence of Latin American military rule, and the magic of childhood. The second introduces the main character of the book: the town of Macondo. The third tells us: "I am making up a new world here, the tired rules of 'realism' don't apply, get ready for a wild ride."

I read this book a long time ago but I bought it again today just to celebrate finding a small French bookstore in Singapore. (Yes, they also sell some books in English.) If you haven't read this, I recommend it. You can read some more on the [Nobel Prize website](#).

July 18, 2012

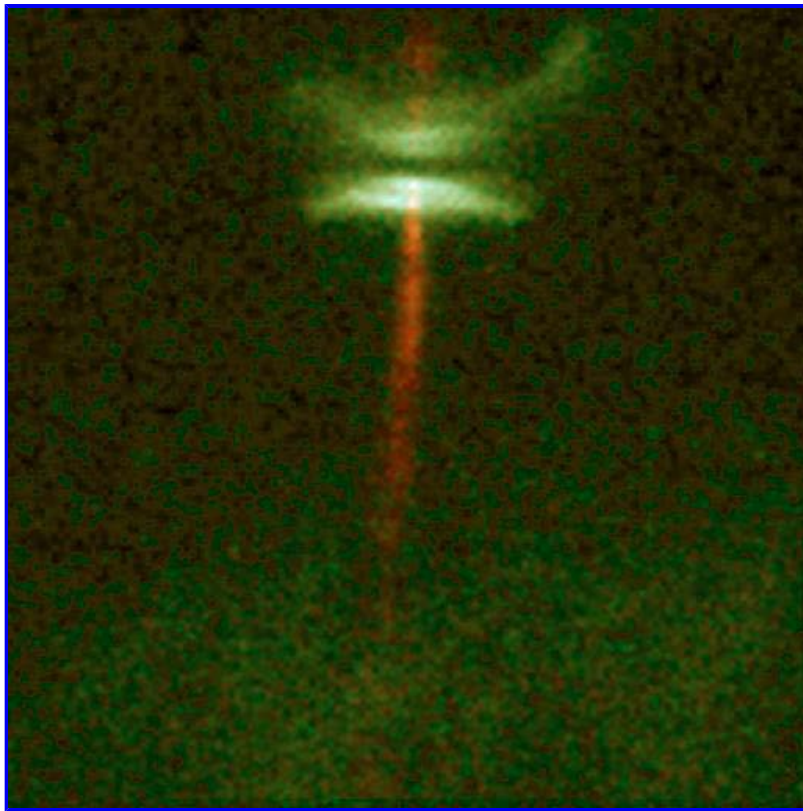


Imagine you're in a space ship in the very early Solar System, before planets form from the [protoplanetary disk](#) shown here. At the frost line, about where the asteroid belt will be, it gets cold enough for ice grains. When you pass this line, the density of solid particles in the disk abruptly increases by a factor of 3 or 4. So, these particles will stick together to form larger bodies—and faster, too! This means that gas giants are more likely to appear beyond the frost line, since the bodies that form beyond this line are bigger and have more time to accrete gas from the disk before it dissipates.

The frost line is also called the 'snow line', and you can read more about it here:

- [The "snow line" in protoplanetary disks](#), The ISM and Star Formation, Harvard Astronomy 201B.

What would it actually look like as you approached the early Solar System? Maybe like this:



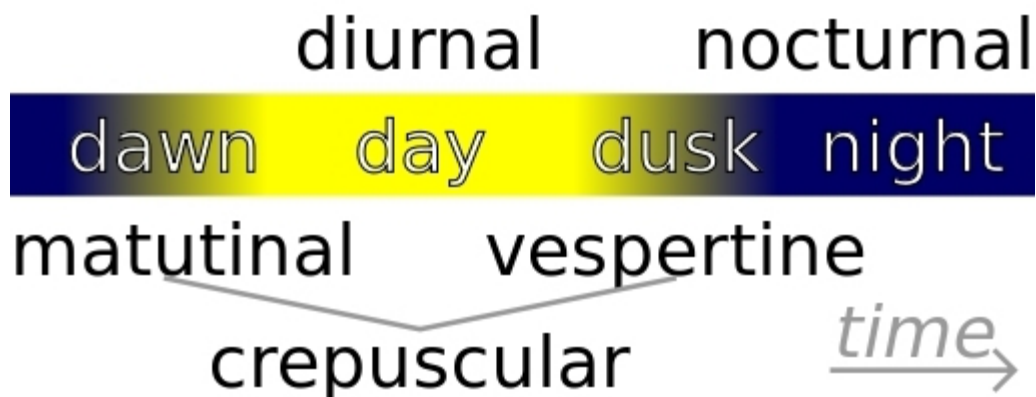
This is a protoplanetary disk called Object HH 30 in the constellation of Taurus, 450 light years away. It's about 0.006 times the mass of our Sun, and some astronomers think it may last only about 100,000 years, a blink of an eye in the world of astronomy. There's a huge jet of hot gas shooting out of the star. This is common, but we don't know how these jets are focused.

For more, see:

- [Hubble space telescope observations of the disk and jet of HH 30](#), *The Astrophysical Journal* **473** (1996), 437–451.

July 25, 2012

When are you most active? Are you diurnal, nocturnal, matutinal, vespertine, crepuscular... or cathemeral?



Animals used to be classified as either diurnal or nocturnal, but it's more complicated than that. Most of the words above are explained in this chart. But a **cathemeral** organism is one that's active at sporadic and seemingly random times during the day or night. An example is the common brown lemur.

It would also be good to have fancy words for people (and maybe animals) who are most active either from dawn to noon or from noon to dusk. Luckily, good candidate words already exist: **antemeridial** for before noon, and **pomeridial** for afternoon.

[For my August 2012 diary, go here.](#)

It can be said with complete confidence that any scientist at any age who wants to make important discoveries must study important problems. Dull or piffling problems yield dull or piffling answers. It is not enough that the problem should be interesting: almost any problem is interesting if it is studied in sufficient detail. - Peter Medawar

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[For my July 2012 diary, go here.](#)

Diary - August 2012

John Baez

August 1, 2012



This Cycladic stone head [at the Metropolitan Museum of Art](#) is from around 2700-2500 BC. The [Cycladic civilization](#) seems to have started around 3200 BC, a bit before the Minoans in nearby Crete, and it kept going strong until around 2000 BC, when they were invaded first by the Minoans and then the Mycenaeans. I find their art elegant and enigmatic... especially since the paint has worn off.

The whole [history of interactions](#) between the Cycladic, Minoan, Mycenaean and Helladic cultures seems fascinating to me, up to and including the invasion of the mysterious '[Sea Peoples](#)', and then the '[Greek Dark Ages](#)' from 1200 to 800 BC. I know so little about all this! Then came the iron age and things get more familiar.

Wikipedia on the [Greek Dark Ages](#):

Around this time large-scale revolts took place in several parts of the Eastern Mediterranean, and attempts to overthrow existing kingdoms were made as a result of economic and political instability by surrounding

people who were already plagued with famine and hardship. Part of the Hittite kingdom was invaded and conquered by the so-called Sea Peoples whose origins — perhaps from different parts of the Mediterranean, such as the Black Sea, the Aegean and Anatolian regions - remain obscure.

August 4, 2012



For the first time in the history of the world, 300 players of the viola da gamba got together! Listen:

- Jeff Lunden, [Gathering of the viols: the 50th annual viola da gamba conclave](#), *Deceptive Cadence*, National Public Radio, August 4, 2012.

Says one: "I maintain that all violas da gamba, of any size, have little invisible arms that are hinged the other way from ours. The first time you put one in your lap, it reaches around you and grabs on and it never lets go. Once you've tried it, you can't stop."

The violas da gamba, or [viols](#), are a family of instruments that are shaped a bit like violins, and played with a bow—but they have frets, and they're tuned in fourths rather than fifths, and the bow is held underhand. They're all played between the knees like a cello, even the small ones.

These days they come in 6 sizes: the big contrabass (also called a violon), the bass, the tenor, the alto, the treble—and the smallest and rarest of all, the pardessus de viole.

Where did they come from? In the mid-1400s, a flat-backed lute called the vihuela or viola da mano was developed in the Kingdom of Aragsn, in what's now Spain. It was plucked, but in the second half of that century people started to play it with a bow—and thus the viola da gamba was born!

For more, visit [violadagamba.com](#). The picture above comes from there!

August 5, 2012



Ah, the good old days... 85 million years ago, when you could sail west from [Appalachia](#) across the [Western Interior Seaway](#) to [Laramidia](#). It was a beautiful shallow sea, just 750 meters deep, usually calm, and great for snorkeling - though you had to keep an eye out for occasional sharks and predatory marine reptiles such as plesiosaurs and mosasaurs, which could get up to 18 meters long. I really miss those days.

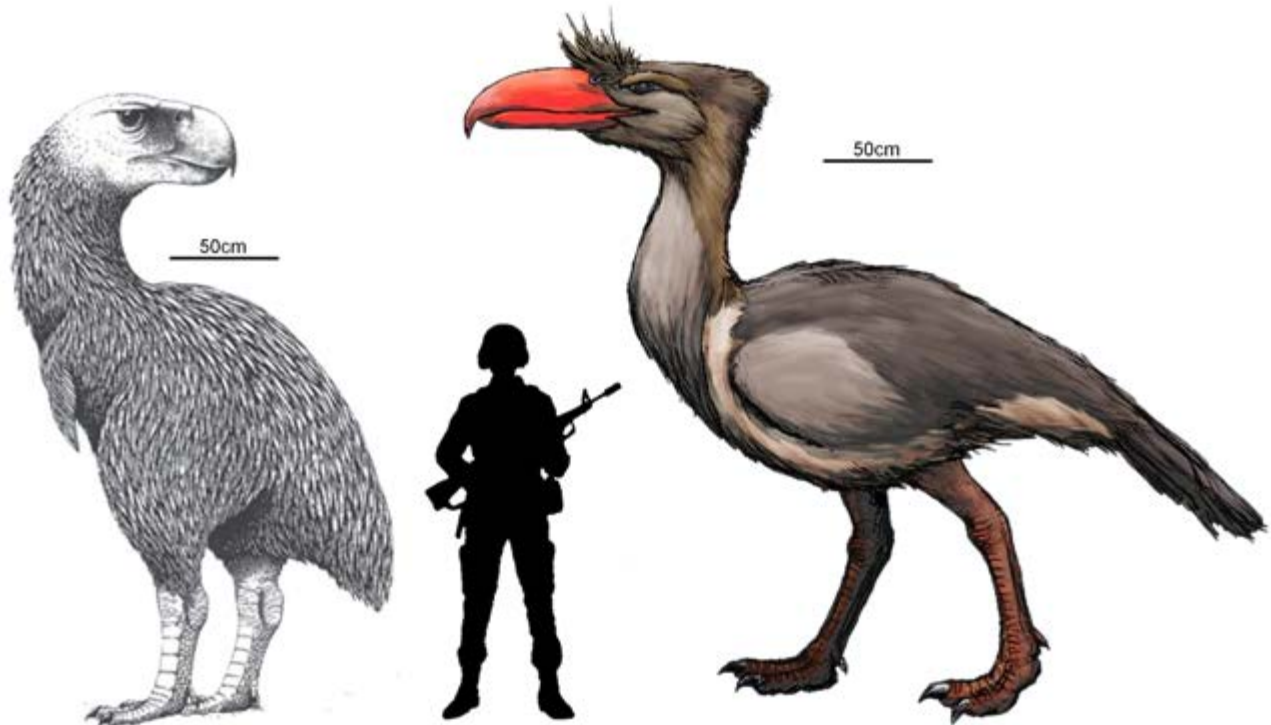


The worst day of my life was when that [10-kilometer meteor](#) slammed into the Gulf of Mexico about 65 million years ago. It hit with the energy of a 100-teraton bomb and made a tsunami 3 kilometers high... but the worst part, for those of us far away from the impact, was the molten rock that shot into the air and started wildfires around the world... and then the dust, which darkened the sky for years, [killing the plants](#).

August 6, 2012



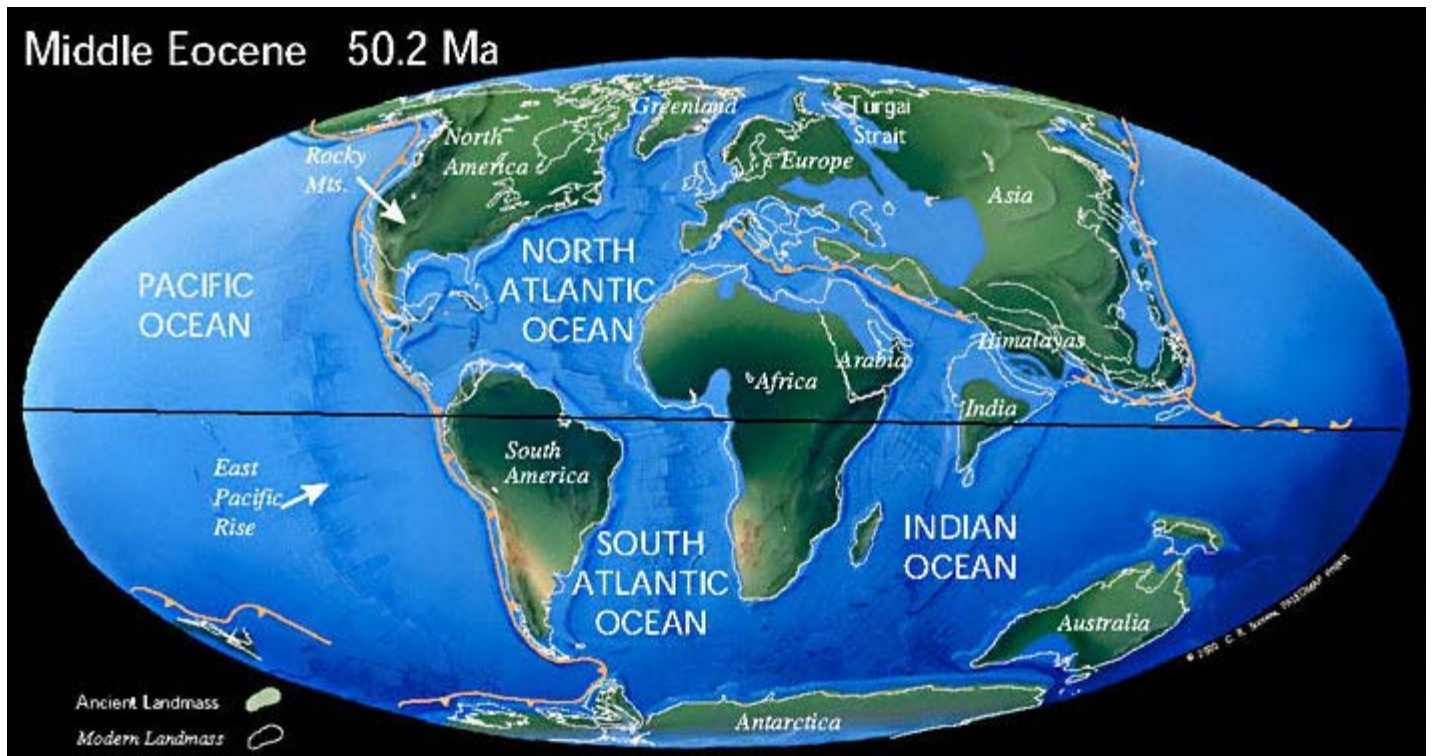
Some people think the dinosaurs went extinct when that big meteor hit, but they obviously weren't around. Birds are technically classified as dinosaurs even now, but back then it wasn't 'technical'—just because those bastards had feathers didn't make 'em any less scary. This thing called [Gastornis](#) ate horses for snacks! Horse d'oeuvres, you might say. Of course [horses were just the size of foxes](#) when they first showed up around 55 million years ago, so this thing isn't as huge as it may look to you youngsters. Still, they got up to 2 meters tall. Nasty, too.



The right to bear arms made a lot of sense back when enormous 'terror birds' roamed Texas and Florida, able to kill their prey with powerful hatchet-like pecks. Even larger ones lived in South America! The biggest were 3 meters tall, with beaks almost half a meter long.

They're all from a family called [Phorusrhacidae](#), which arose around 60 million years ago. For a while people believed they survived until humans showed up in the Americas around 14,000 years ago. But in fact it seems they went extinct much earlier, when North and South America collided about 2 million years ago. [Titanis walleri](#), the species found in Texas and Florida, is the only one known to have migrated north when this happened. Maybe the big mammals were meaner?

August 7, 2012



I used to really enjoy cruises in the [Tethys Sea](#). Here's what it looked like 50 million years ago, about 15 million years after that big meteorite hit and wiped out lots of dinosaurs. What you call the Mediterranean, the Black Sea and the Caspian Sea are all just leftovers of this much bigger sea. Back then, when it got really hot, it was fun to sail up the [Turgai Strait](#), which separated Europe and Asia, all the way up to the Arctic.

But then Africa crashed into Europe, and India crashed into Asia, and a lot of mountains formed, and the Tethys shrank to almost nothing. That really spoiled my summer vacations.

By the way, this map was made by C. R. Scotese for the [PALEOMAP Project](#). It's definitely worth checking out all those maps!

August 8, 2012



Remember how I told you about the Mediterranean drying out and becoming a big salty desert? In fact I was driving across it in my jeep one day when someone called me and warned me that the Atlantic had broken through and was rushing in! It was 5.33 million years ago, but I remember it like yesterday. I got out of there fast, and it's a good thing. Once it really got going, the water was pouring down a kilometer drop at 1000 times the flow rate of the Amazon. The water level rose at more than 10 meters a day, and the whole Mediterranean Sea filled up in less than two years! Now they call it the [Zanclean Flood](#).

August 10, 2012



Today I've been listening to Jon Balke's album *Siwan*. This is some serious stuff, featuring Jon Balke on harpsichord, Jon Hassell on trumpet, Kheir Kachiche on violin, Helge Norbakken and Pedram Zamini on Middle-Eastern percussion instruments, an orchestra, and the great Lebanese singer Amina Alaoui on vocals. It's inspired by Andalusian music.

This particular piece, 'Toda Ciencia Trascendiendo', has lyrics from the famous poem of that title by the mystic [Juan de Yepes Alvarez](#). It slowly builds up to a galloping, fiery climax with Hassell doing his thing.

The lyrics are in Spanish, but here's an English translation. They're pretty intense. I don't think you need to be a theist to experience this sort of thing.

1

I entered into unknowing,
yet when I saw myself there,
without knowing where I was,
I understood great things;
I will not say what I felt
for I remained in unknowing
transcending all knowledge.

2

That perfect knowledge
was of peace and holiness
held at no remove
in profound solitude;
it was something so secret
that I was left stammering,
transcending all knowledge.

3

I was so 'whelmed,
so absorbed and withdrawn,
that my senses were left
deprived of all their sensing,
and my spirit was given
an understanding while not understanding,
transcending all knowledge.

4

He who truly arrives there
cuts free from himself;
all that he knew before
now seems worthless,
and his knowledge so soars
that he is left in unknowing
transcending all knowledge.

5

The higher he ascends
the less he understands,
because the cloud is dark
which lit up the night;
whoever knows this
remains always in unknowing
transcending all knowledge.

6

This knowledge in unknowing
is so overwhelming
that wise men disputing
can never overthrow it,
for their knowledge does not reach
to the understanding of not
understanding,
transcending all knowledge.

7

And this supreme knowledge
is so exalted
that no power of man or learning
can grasp it;
he who masters himself
will, with knowledge in
unknowing,
always be transcending.

8

And if you should want to hear:
this highest knowledge lies
in the loftiest sense
of the essence of God;
this is a work of his mercy,
to leave one without
understanding,
transcending all knowledge.

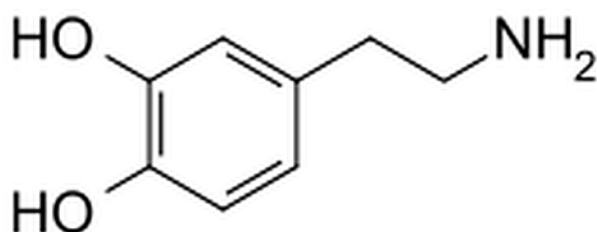
August 12, 2012



One-third human, two-thirds hideous monster, this picture was created by Phil McCarthy's [Pareidolooop](#) program, which creates random images and then 'evolves' them to look more like faces. The program takes a long time, but you can see several hours go by in minutes [here](#).



August 15, 2012



[Dopamine](#) is a simple molecule that plays many roles in our brains. It's a neurotransmitter released by neurons in at least 8 pathways in the brain, and it then attaches to 'receptors' on other neurons. It's crucial to the brain's reward system, but scientists argue about whether it's more about pleasure or desire—that is, enjoying or wanting. Nicotine, cocaine and amphetamines produce high levels of dopamine in the brain, messing up its reward system and turning people into addicts. On the other hand, mice who cannot synthesize dopamine don't bother to eat! They lack the pleasure or desire we associate with eating.

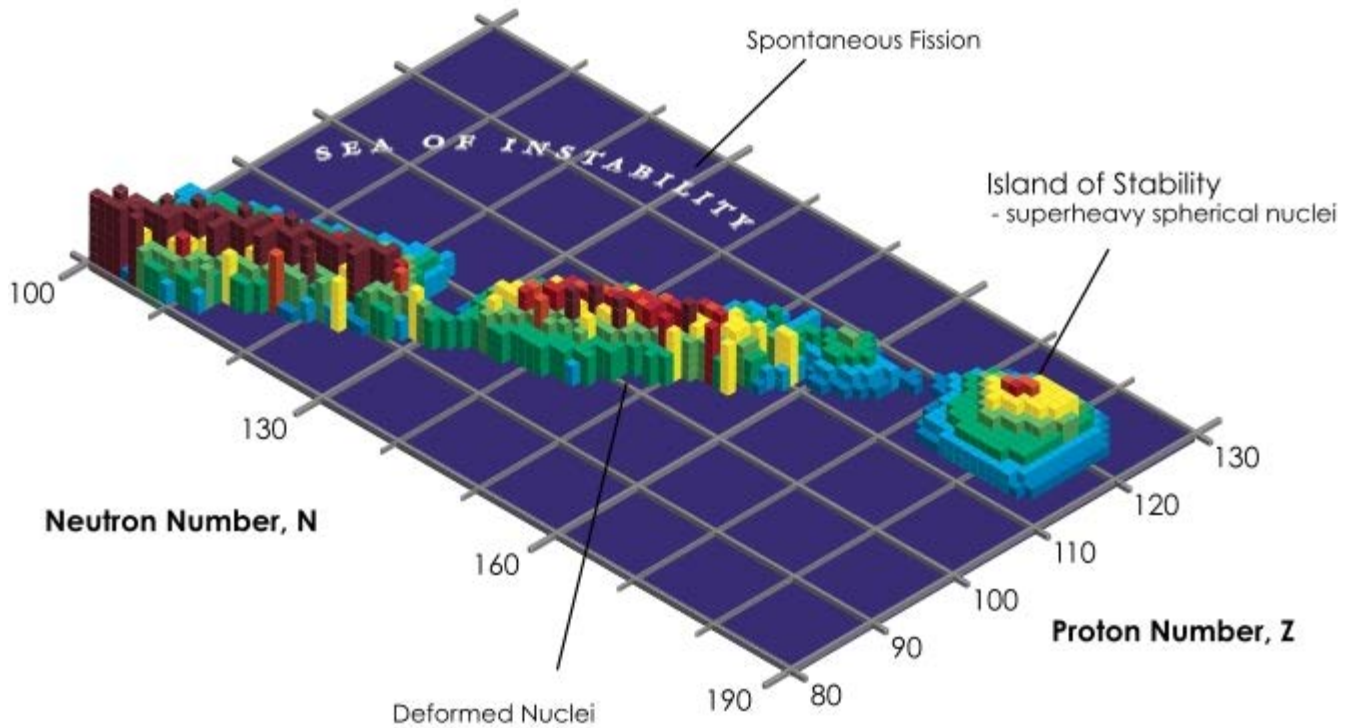
August 16, 2012

Do your smart friends think they know all the elements? Ask them about *flerovium* and *livermorium*! These elements were first officially named on May 30th. But news travels slow to Singapore, so:

[Flerovium](#) is element 114. It sits below lead in the periodic table, but there are hints that it acts chemically more like a noble gas. For atoms this big, the electrons zip around near the speed of light. Special relativity kicks in and changes how chemistry works. Already with gold, I hear special relativity is to blame for its special golden color. But making a metal act like a noble gas—that's serious!

[Livermorium](#) is element 116. It sits below polonium in the periodic table, which sits below tellurium, which sits below selenium... and we all know the chemical properties of *that* element. (If not, ask your smart friends.) But nobody knows if livermorium is chemically like polonium, because only about 35 atoms of the stuff have been studied!

Flerovium and livermorium used to be called by the tentative names 'ununquadium' and 'ununhexium', after their atomic numbers. My favorite name like this is 'unununium': element 111. But now it's called 'roentgenium'.



The really important thing about flerovium is that it may sit close to the [island of stability](#), a hypothesized patch of super-heavy elements that decay more slowly than their neighbors. But the longest-lived isotope of flerovium we've seen so far is flerovium-289, with a half-life of about 2.6 seconds. There's some evidence for another form, flerovium-289b, which lasts ten or twenty times longer. Flerovium-288 should last even longer: radioactive atoms last longer when they have certain '[magic numbers](#)' of protons and neutrons, and magic numbers are always even.

[For my September 2012 diary, go here.](#)

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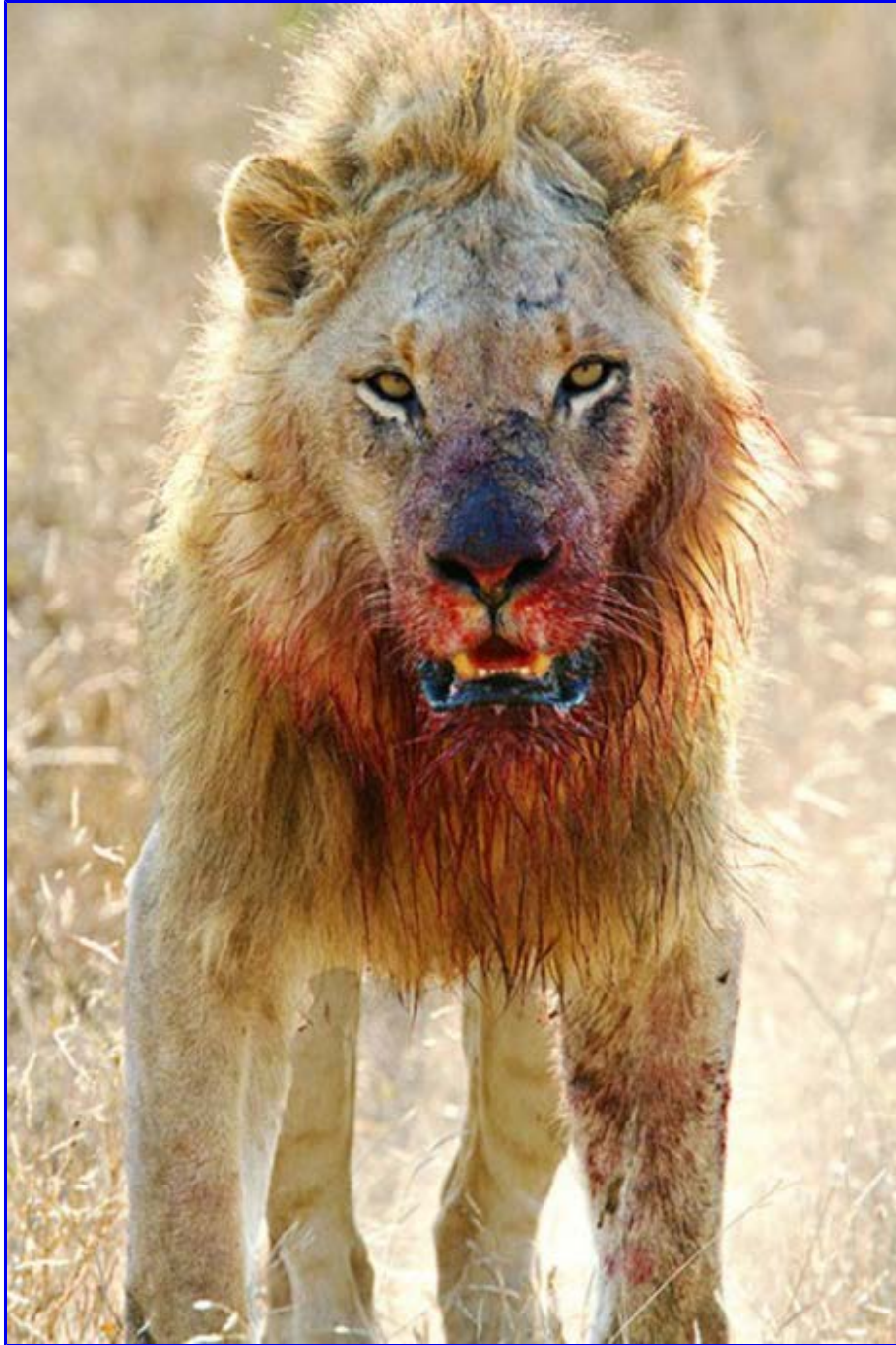
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[For my August 2012 diary, go here.](#)

Diary - September 2012

John Baez

September 1, 2012



September 2, 2012



This is [*Felis silvestris*](#): a species of wild cat from which the house cat *Felis catus* descends. In fact they interbreed, so some argue they should count as the same species, but the wild ones are bigger.

Felis silvestris seems to have appeared in Europe about 2 million years ago. Around 50,000 years ago it migrated from Europe to the Middle East, giving rise to some subspecies called steppe wildcats. Steppe wildcats then spread into Asia and Africa. *Felis silvestris* reached the British Isles from mainland Europe 9000 years ago, at the end of the last ice age, before rising sea levels created the British Channel.

Felis silvestris in turn descended from [*Felis lunensis*](#), or Martelli's wildcat, which appeared in Europe around the end of the Pliocene and beginning of the Pleistocene, 2.5 million year ago. It would be cool if we could use genetic engineering to recreate Martelli's wildcat and even earlier kinds of cats. But there are also lots of wild cat species alive today, some on the brink of extinction, which deserve to be saved.

September 3, 2012



This [cat named Venus](#) is a 'chimera': it has two sets of genes. In a sense, it is its own fraternal twin:

A chimera is typically formed from four parent cells (either two fertilized eggs, or two early embryos that have fused together). When the organism forms, the cells that had already begun to develop in the separate embryos keep their original phenotypes and appearances. This means that the resulting animal is a mixture of tissues and can look like this gorgeous (but bizarre) kitty.

September 10, 2012

An infinity of foods for an infinity of ghosts!



At the Buddha Tooth Relic Temple in Singapore, we recently saw these tables set up for the [Hungry Ghost Festival](#). It

happens in the middle of the 7th lunar month, Ghost Month, when the gates of hell are opened and ghosts are free to roam the earth, where they seek food and entertainment. Hungry ghosts are ancestors of people who neglected to give them a proper funeral or pay tribute to them after they died.

September 14, 2012



Lisa and I had dinner on Keppel Island, off the south shore of Singapore. We took a walk got a great view of the mangrove forests and the strange towers on the mainland directly to the north.







[For my October 2012 diary, go here.](#)

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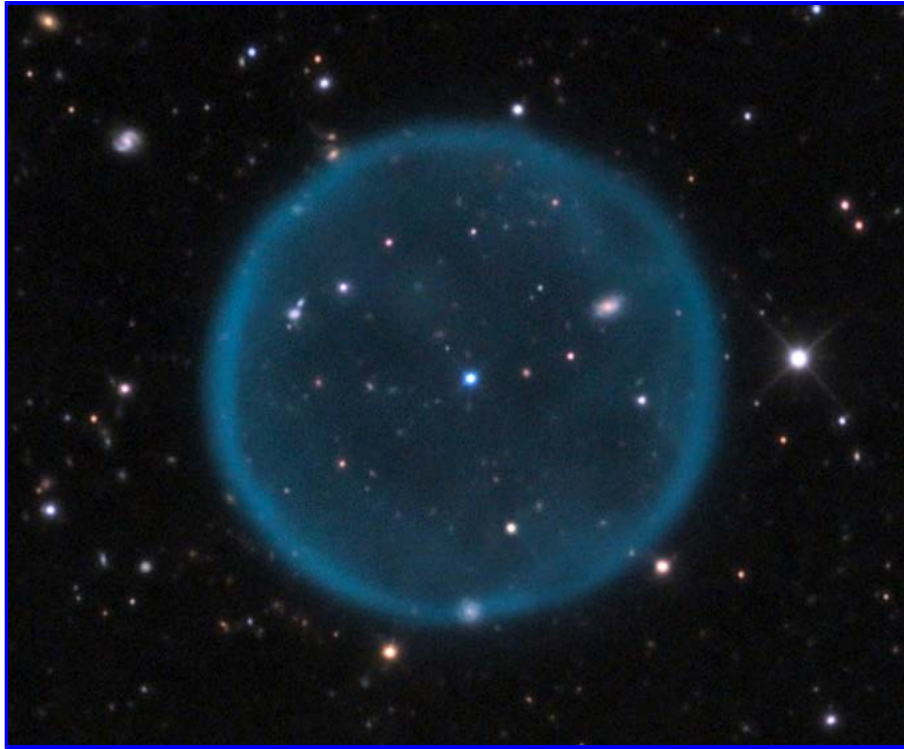
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[For my September 2012 diary, go here.](#)

Diary - October 2012

John Baez

October 1, 2012



This is one of the largest known near-perfect spheres in the Universe! It's called [Abell 39](#) and it's 2.5 light years in diameter. When a star about the mass of our Sun runs out of fuel, it first expands to become a red giant, and then its outer layers are expelled, forming a so-called planetary nebula like this... though it has nothing to do with planets: people were confused when they made up that name.

Usually planetary nebulae get distorted in interesting ways, but this one is almost perfectly round! However, the star in the middle is not at the exact center: it's about 1/10 of a light-year off to one side.

Do you know why this nebula looks brighter near the edges?

October 5, 2012



From 1979 to 1982, Ranulph Fiennes led the 'Transglobe Expedition', the first trip around the world to cross both poles on land. In 1993 he crossed Antarctica in 90 days with just one partner. In 2000 he tried to be the first to hike solo to the North Pole. He cancelled this 840-kilometer trek when he developed frostbite in his left hand - he'd plunged it into freezing water when one of the sledges he was towing fell through thin ice. In 2009, at the age of 65, he became the oldest person to climb Mount Everest. This was his third attempt. He suffered a heart attack on his first, but this didn't stop him from trying until he succeeded.

Now he's planning a six-month trek across Antarctica in the depths of winter! He'll leave for Antarctica on December 6th, and hopes to begin his trek on March 21st next year. He and his 5 team members will travel on skis, but will be followed by two modified tractors, towing two sledge-mounted living quarters, supplies, equipment, and 155,000 liters of special fuel. They will have to climb 3000 meters onto the inland plateau, trek for several hundred kilometers with all the supplies and equipment they need, descend 3000 again... and finally trek 3000 kilometers to reach the Ross Sea.

For more on his plan see:

- Maev Kennedy, [Sir Ranulph Fiennes to attempt record winter Antarctica trek](#), *The Guardian*, 17 September 2012.

For more on the Transglobe Expedition:

- Scott Polar Research Institute, [Transglobe Expedition 1979-82](#), Freeze Frame.

For his failed attempt to reach the North Pole on his own:

- [North Pole bid defeated by frostbite](#), *BBC News*, 22 February 2000.

October 23, 2012



In 794, the [Council of Frankfurt](#), called by Charlemagne, condemned "the persecution of alleged witches and wizards". It called the belief in witchcraft "superstitious", and ordered the *death penalty* for those who presumed to burn witches.

The craze for [witch hunts](#) reached its heights much later, from 1480 to 1750.

[For my November 2012 diary, go here.](#)

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[For my October 2012 diary, go here.](#)

Diary - November 2012

John Baez

November 1, 2012



Here is a photo of Manhattan taken by Iwan Baan on the night of Wednesday October 31, after it was hit by Hurricane Sandy. It appeared on the cover of [New York](#) magazine.

November 17, 2012



Avant-garde artist Johnson Chang has outdone himself. He's recreated an entire traditional Chinese village, Jinze, using ancient building methods! "I want to see the revival of Chinese material culture. Four thousand years of tradition need to be kept alive. ... no other country has tried to cut off its history more radically."

- Tony Perrottet, [The shock of the old](#), *Wall Street Journal*, 28 June 2012.

November 24, 2012

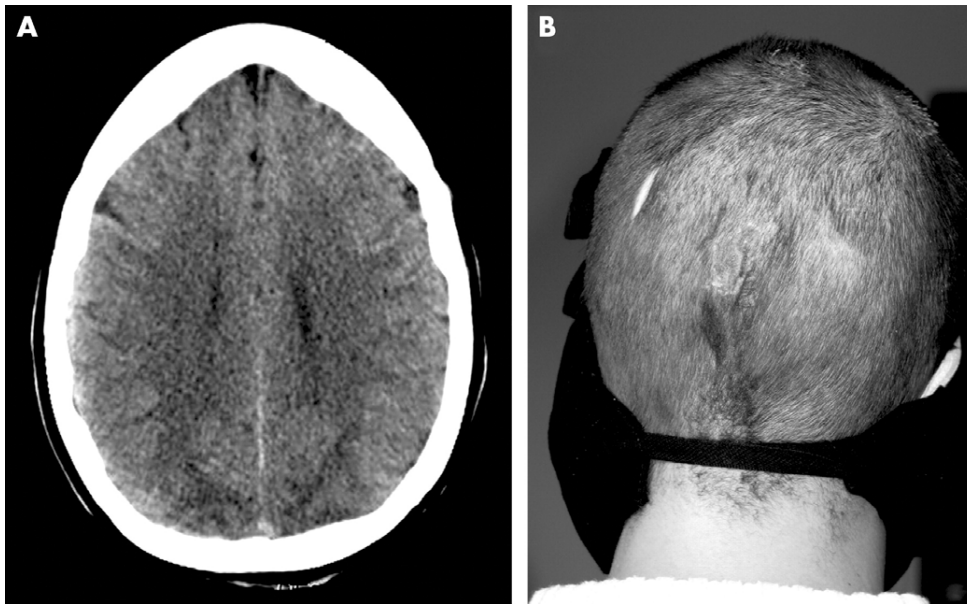


There's no place like... Tiandechung. It's an imitation of Paris: a gated community in China, built in 2007 by Zhejiang Guangsha Co. Ltd.. It has room for 100,000 people, but at last report only 2,000 people lived there, and many of the Parisian-style apartments are occupied by migrant workers who are building the place.

One hour's drive away there's an imitation of London! See more pictures here:

- [Made in China: European clone towns](#), *Messy Nussy*, 20 November 2012.

November 25, 2012



On 3 September 2004, a 23-year-old woman was hit by a 'bolt from the blue' while climbing on a ridge in the Alps. Her partner said the sky was clear and sunny — when suddenly he heard cracking thunder and was thrown to the ground by a massive shockwave! The woman was also thrown down. She lost consciousness for a few seconds and was confused afterwards. She had no vision, and was dazzled by a bright light. She was rescued by air, hospitalized and, because of extreme agitation, was sent into a drug-induced coma for 3 days.

After being weaned from a respirator, she was initially alert. But she complained of blurred vision, and saw golden flashes throughout her whole visual field. She couldn't read, but she could recognize familiar faces.

That evening, things got weirder. She started seeing unknown people, animals and objects acting in different scenes, as if in a movie. None of the persons or scenes was familiar to her, and she became very frightened by their occurrence.

For example, an old lady was sitting on a ribbed radiator, who then became thinner and thinner, finally vanishing through the slots of the radiator. Later, on her left side a cowboy riding on a horse came from the distance. As he approached her, he tried to shoot her, making her feel defenseless because she couldn't move or shout for help.

In another scene, two male doctors, one fair and one dark haired, and a woman, all with strange metal glasses and unnatural brownish-red faces, were tanning in front of a sunbed, then having sexual intercourse and afterwards trying to draw blood from her.

She couldn't tell if these scenes were real or unreal. She didn't report them at the time for fear that she might be considered insane. She insisted on being transferred to her hometown hospital.

In 10 days she had almost completely recovered, with just a single persistent spot in her visual field. She felt good.

But 20 weeks after the accident, she reported feeling mournful and unenergetic. For a month, she'd been having frequent nightmares that included strange flashbacks — pardon the pun — exactly replicating the visual hallucinations and paranoid delusions she originally had!

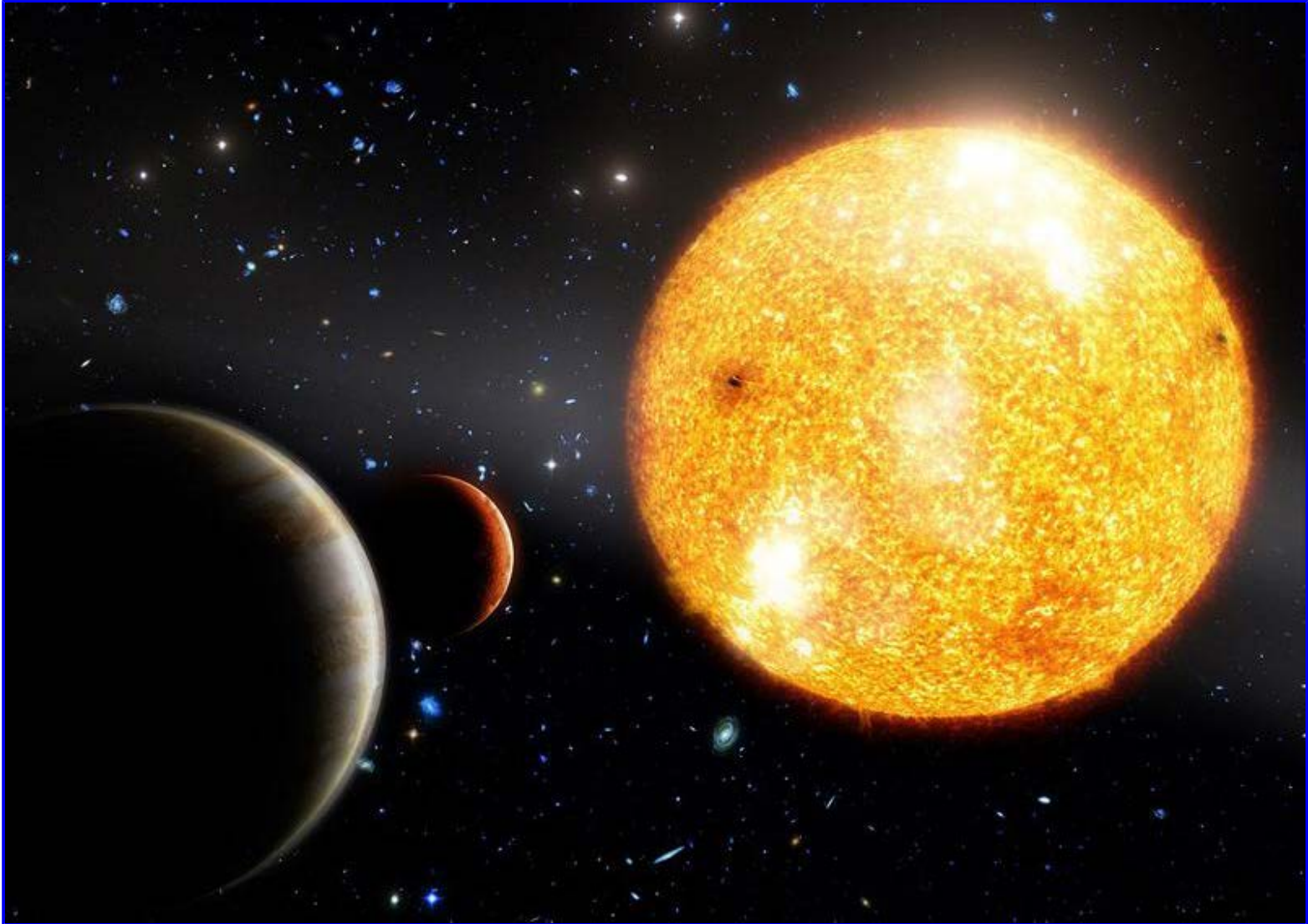
She had trouble sleeping due to these nightmares. She was treated with 20 milligrams of paroxetine and referred to a specialist in trauma therapy. Her nightmares vanished after 2 weeks. During the next few months, she experienced several depressive episodes and considered suicide... but eventually she completely recovered.

She experienced those hallucinations just once more, the night after her grandmother's house caught on fire. But for long after the initial lightning strike, she remembered the different scenes very well and was able to describe every detail.

It's interesting how something crude like a lightning bolt can do such complex and specific things. This tale is summarized from:

- Ingo Kleiter, Ralf Luerding, Gerhard Diendorfer, Helga Rek, Ulrich Bogdahn and Berthold Schalk, [A lightning strike to the head causing a visual cortex defect with simple and complex visual hallucinations](#), BMJ Case Reports 2009.

November 30, 2012



Astronomers recently found some incredibly old planets: 12.8 billion years old! That's amazing, because the Universe is just 13.5 billion years old... so back when these planets and the star they orbit were formed, there wasn't much except hydrogen and helium: not many heavier elements had formed yet! By comparison, our solar system is 4.5 billion years old.

This star is called HIP 11952. It's in our galaxy just 375 light years away, and it's only half as massive as our Sun (hence its long life). Its two Jupiter-sized planets have orbital periods of 290 days and 7 days. For more see this nice article:

- Deborah Byrd, [How and when did the first planets form in our universe?](#), *EarthSky*, September 15, 2012.

and the original paper:

- Johny Setiawan, Veronica Roccatagliata, *et al*, [Planetary companions around the metal-poor star HIP 11952](#).

The picture is by [Timotheos Samartzidis](#).

[For my December 2012 diary, go here.](#)

NEW YORK - Following Hurricane Sandy's destructive tear through the Northeast this week, the nation's 300 million citizens looked upon the trail of devastation and fully realized, for the first time, that this is just going to be something that happens from now on.

Gradually comprehending that this sort of thing is now just a fact of life, citizens all across America stared blankly at images of destroyed homes, major cities paralyzed by flooding, and ravaged communities covered in debris, and finally acknowledged that this, apparently, is now a regular part of the human experience.

"Oh, I see — this is just going to be how it is from here on out," said New York City resident Brian Marcello, coming to terms with the fact that an immense storm that cripples mass transit systems and knocks out power for millions in the nation's largest metropolitan area can no longer be regarded as an isolated, freak incident, and will henceforth be just a normal thing that happens. "Hugely destructive weather events are going to keep happening, and they are going to get worse and worse, and living through them is something that will be a part of all our lives from now on, whether we like it or not."

"I get it now," Marcello added. - [The Onion](#)

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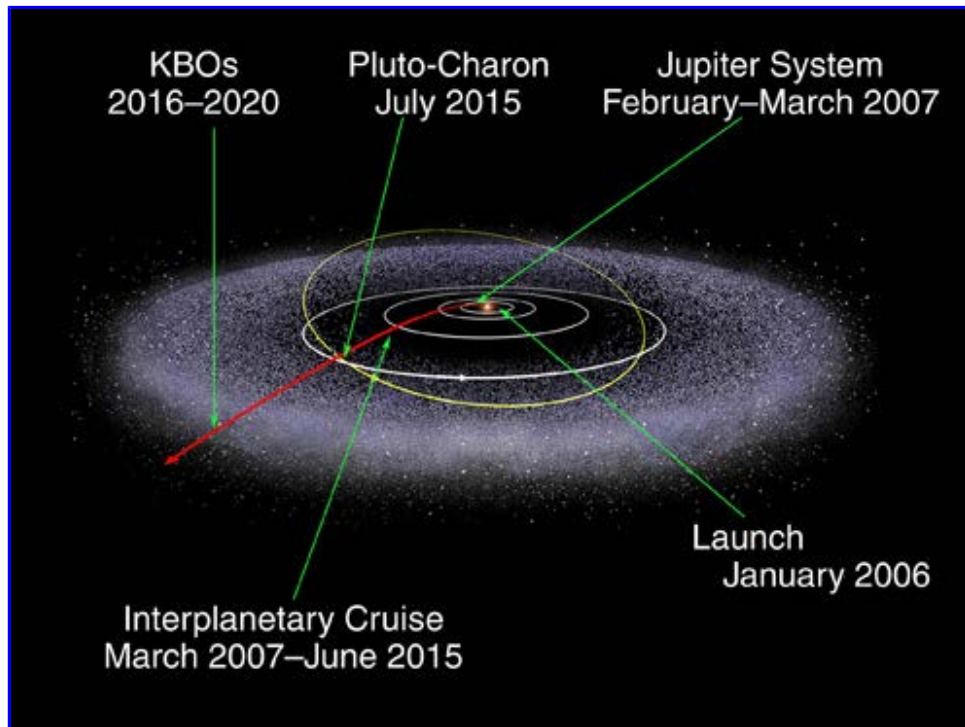
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Diary - December 2012

John Baez

December 1, 2012



We're going on a great adventure! [New Horizons](#) has already taken great photos of volcanoes on Jupiter's moon Io. It's already closer to Pluto than we've ever been. And on 14 July 2016 it will fly by Pluto and its moons Charon, Hydra, and Nix!

But that's just the start: then it will go to see some KBOs!

The [Kuiper Belt](#) stretches from the orbit of Neptune to almost twice as far from the Sun. It's a bit like the asteroid belt, but much bigger: 20 times as wide and 20 - 200 times as massive. But while most asteroids are made of rock and metal, most Kuiper Belt Objects or 'KBOs' are composed largely of frozen methane, ammonia and water.

The Earth's orbit has a radius of one [astronomical unit](#), or AU. The Kuiper Belt goes from 30 AU to 50 AU out. For comparison, the [heliosphere](#), the region dominated by the energetic fast-flowing solar wind, fizzles out around 120 AU. That's where Voyager 1 is now. New Horizons will fly through the Kuiper Belt from 2016 to 2020... and, according to plan, its mission will end in 2026. How far out will it be then? I don't know! Of course it will keep going...

For more see:

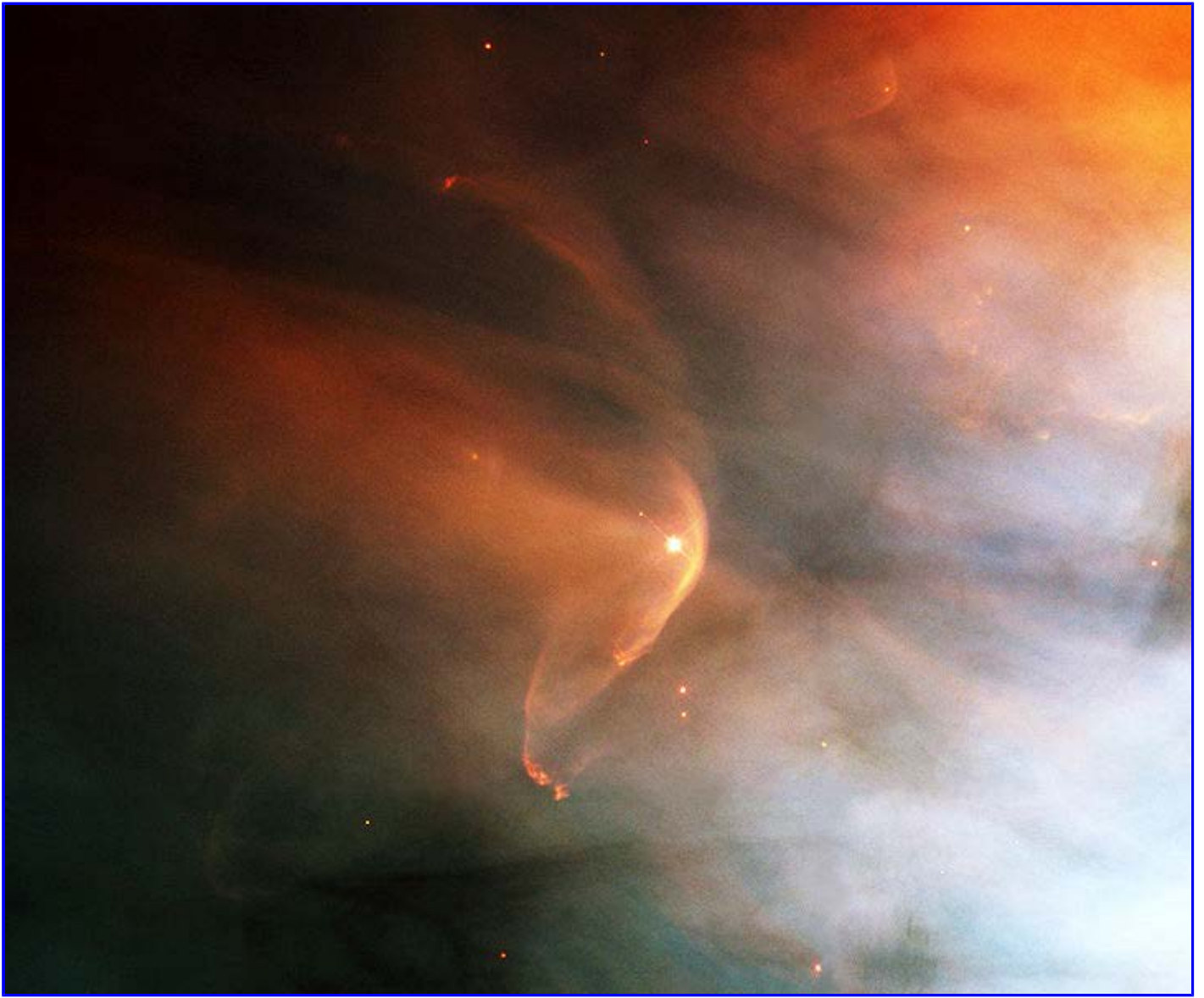
- JPL, [New Horizons: NASA's Pluto-Kuiper Belt Mission](#).

You can read an expanded, more detailed version of my December 1-5 diary entries here:

- John Baez, [Our galactic environment](#), *Azimuth*, December 27, 2012.

Alas, the pictures are smaller there—but if you click on them you'll get a bigger picture and/or more information!

December 2, 2012



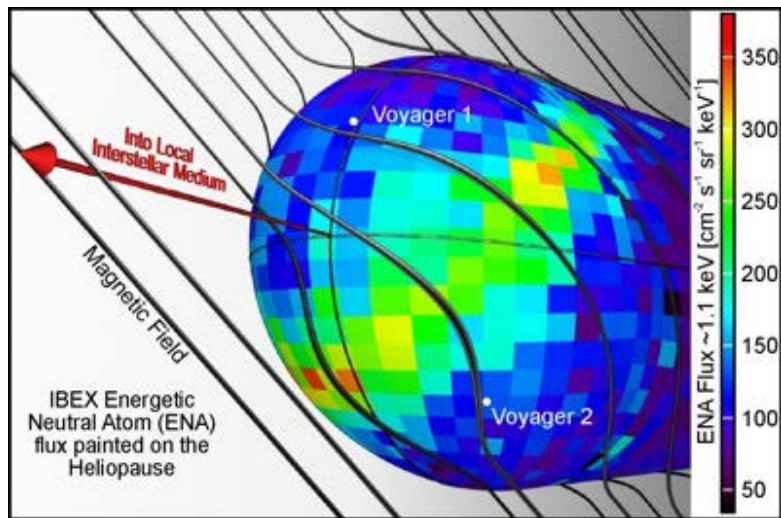
As this young star moves through the Orion Nebula at supersonic speeds, the interstellar gas hits the fast wind of particles shooting out from the star and creates a [bow shock](#) half a light-year across. It's a bit like when a boat moves through the water faster than the speed of water waves.

There's also bow shock where the solar wind hits the Earth's magnetic field. It's about 17 kilometers thick, and located about 90,000 kilometers from Earth.

For a long time scientists thought there was a bow shock where the Sun's solar wind hit the interstellar gas nearby. But this was called into question in 2012 when a satellite called the [Interstellar Boundary Explorer](#) (IBEX) discovered the solar system is moving slower relative to this gas than we thought! This satellite isn't actually going there — it's in Earth orbit, looking out. But Voyager 1 seems close to hitting the [heliopause](#), where the Earth's solar wind comes to a stop. And it's seeing [strange things](#)!

The star in the picture is called LL Orionis, and [this picture](#) was taken by the Hubble Telescope in February 1995.

December 3, 2012



The Sun shoots out a hot wind of ions moving at 300 to 800 kilometers per second. They form a kind of bubble in space: the [heliosphere](#). These charged particles slow down and stop when they hit the hydrogen and helium atoms in interstellar space. But those atoms can penetrate the heliosphere, at least when they're neutral — and a near-earth satellite called IBEX, the [Interstellar Boundary Explorer](#), has been watching them! This picture shows what IBEX has seen.

In December 2008, IBEX first started seeing energetic neutral atoms penetrating the heliosphere. By October 2009 it had collected enough data to see the IBEX ribbon: an unexpected arc-shaped region in the sky has many more energetic neutral atoms than expected. You can see it here!

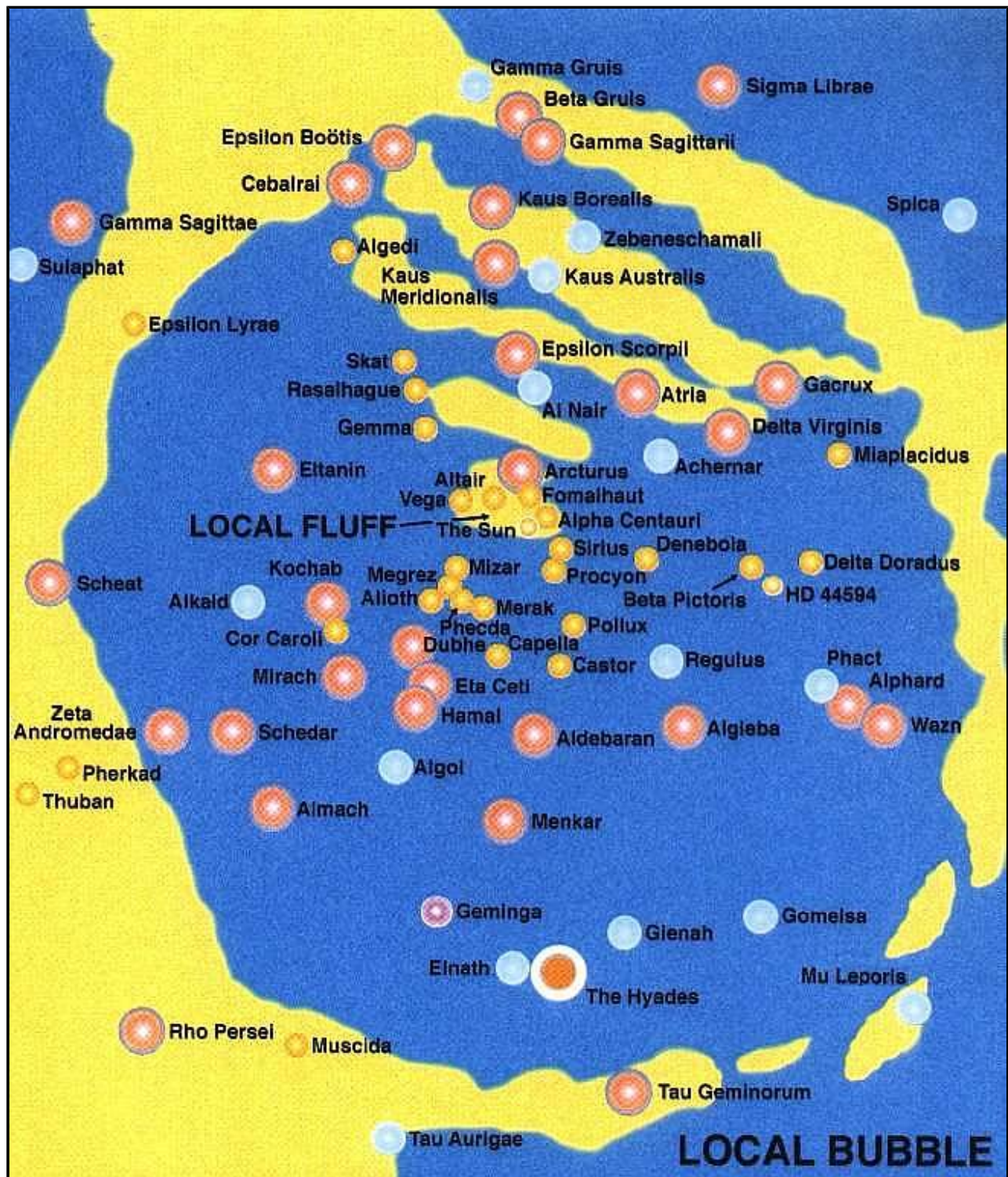
The color shows how many hundreds of energetic neutral atoms are hitting the heliosphere per second per square centimeter per keV. A keV, or kilo-electron-volt, is a unit of energy. Different atoms are moving with different energies, so it makes sense to count them this way.

You can see how the Voyager spacecraft are close to leaving the heliosphere. You can also see how the interstellar magnetic field lines avoid this bubble. Ever since the IBEX ribbon was detected, the IBEX team has been trying to figure out what causes it. They think it's related to the interstellar magnetic field. The ribbon has been moving and changing intensity quite a bit in the couple of years they've been watching it!

Recently, IBEX announced that our solar system has no [bow shock](#) — a big surprise. Previously, scientists thought the heliosphere created a bow-shaped shock wave in the interstellar gas as it moved along, like the wake of a boat.

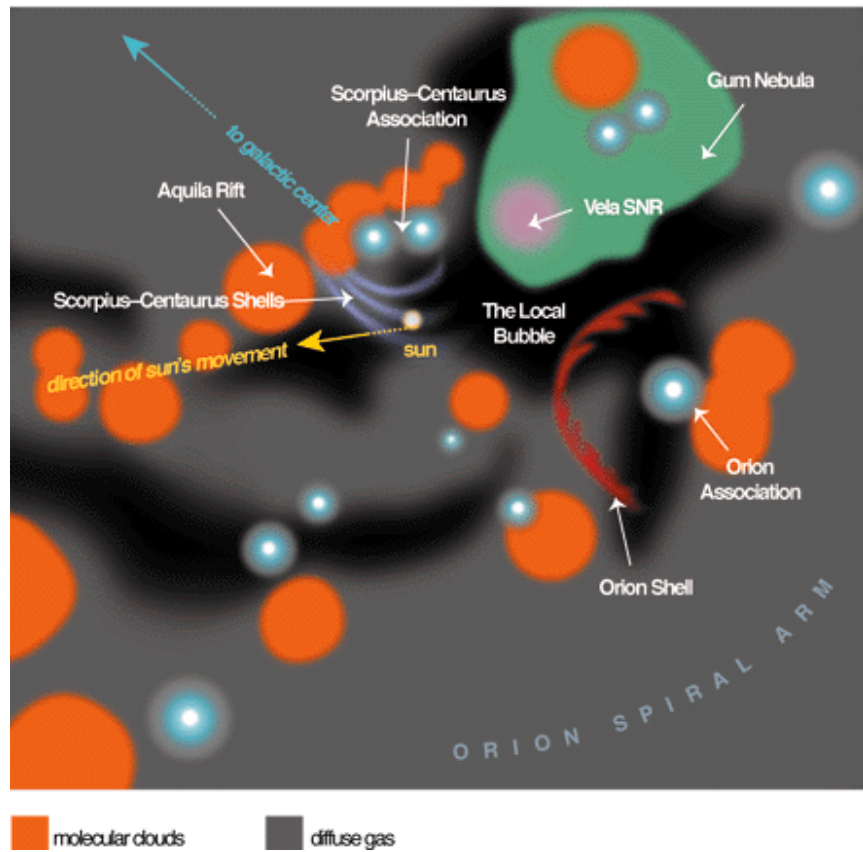
December 4, 2012

Get to know your neighborhood!



I love the names of these nearby stars! Some I knew: Vega, Altair, Fomalhaut, Alpha Centauri, Sirius, Procyon, Denebola, Pollux, Castor, Mizar, Aldebaran, Algiol. But many I didn't: Rasalhague, Skat, Gaerux, Pherkad, Thuban, Phact, Alphard, Wazn, and Algieba! How come none of the science fiction I've read uses these great names? Or maybe I just forgot.

The [Local Bubble](#) is a bubble of hot interstellar gas 300 light years across, probably blasted out by the supernova called Geminga near the bottom here. But several thousand years ago we entered a cloud of cooler, denser gas: the [Local Fluff](#). We'll leave this in at most 4 thousand years. But this is just the beginning! As we pass the [Scorpius-Centaurus Association](#), we'll hit bigger, colder and denser clouds — and they'll squash the heliosphere.



When will this happen? People seem very unsure. I read different sources saying we entered the Local Fluff sometime between 44,000 and 150,000 years ago, and that we'll stay within it for between 4,000 and 20,000 years. We'll then return to the hotter, less dense gas of the Local Bubble until we hit the next cloud. That may take at least 50,000 years.

When we hit a big cloud, it will squash the [heliosphere](#): the region near the Sun dominated by the solar wind. Right now this is roughly 120 AU in radius. Before we entered the Local Fluff, it was much bigger. And when we hit thicker clouds, it may shrink down to just 1 or 2 AU!

The heliosphere protects us from cosmic rays. So, when we hit the next cloud, more cosmic rays will reach the Earth. Nobody knows what the effects will be... but life on Earth has survived previous incidents like this, so don't stay awake at night worrying about it!

For more on the neighborhood of our solar system and what to expect as we pass through various clouds, try this great article:

- Priscilla Frisch, [The galactic environment of the Sun](#), *American Scientist* **88** (January-February 2000).

Two candidates for the first cloud we'll hit are the G Cloud and the Apex Cloud. They're close. The Apex Cloud is just 15 light years away:

- Priscilla C. Frisch, [Local interstellar matter: the Apex Cloud](#).

I have lots of scientific heroes: whenever I study something, I find impressive people have already been there. This week my hero is Priscilla Frisch. She edited a book called *Solar Journey: The Significance of Our Galactic Environment for the Heliosphere and Earth*. The book isn't free, but this chapter is:

- Priscilla C. Frisch and Jonathan D. Slavin, [Short-term variations in the galactic environment of the Sun](#).

For more, try:

- Hans-R. Mueller, Priscilla C. Frisch, Vladimir Florinski and Gary P. Zank, [Heliospheric response to different](#)

[possible interstellar environments.](#)

December 5, 2012

Here's a picture of the Aquila Rift, taken by Adam Block of the Mt. Lemmon SkyCenter at the University of Arizona:



The Aquila Rift is a region of molecular clouds about 600 light years away in the direction of the star Altair. Hundreds of stars are being formed in these clouds.

A molecular cloud is a region in space where the interstellar gas gets so dense that hydrogen forms molecules, instead of lone atoms. While the Local Fluff near us has about 0.3 atoms per cubic centimeter, and the Local Bubble is much less dense, a molecular cloud can easily have 100 or 1000 atoms per cubic centimeter. Molecular clouds often contain filaments, sheets, and clumps of submicrometer-sized dust particles, coated with frozen carbon monoxide and nitrogen. That's the dark stuff here!

December 6, 2012



San Francisco is a wild and crazy city. I got a hotel for a big meeting of the American Geophysical Society at the last minute, in a bad part of town. It was a bit scary seeing such large numbers of beggars and poor folks hanging around on the streets late at night - though none of them bothered me. I overheard a grizzled bum wearing plaid pants and a crazy poncho that looked like a rug walking along talking to a friend. "You're either with them or against them. They don't want you to be a man of your own. And that's something I'm still learning how to do." And near the entrance of the conference I saw a guy shouting at the top of his lungs, "If you want to stop tsunamis and floods, honor your father and mother!"

Both Riverside and Singapore are such tame places by comparison. Even Bangkok and Hanoi seemed very safe and cozy by comparison. This picture is not mine; it was taken in San Francisco in 2008 by [Doczilla](#).

December 21, 2012

Today Lisa, my aunt and I began a road trip to *Naabeehó Bináhásdzo*.

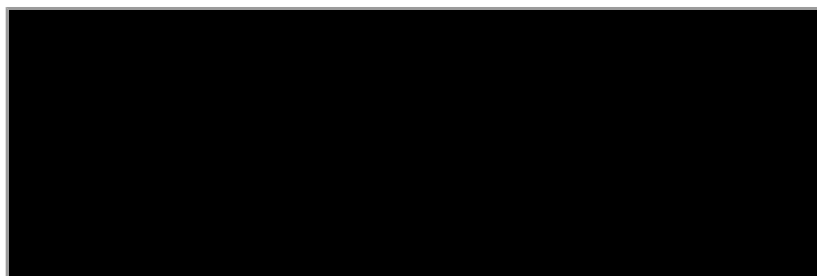
That's the [Navajo Nation](#), a huge semi-autonomous region, 71,000 square kilometers in area, located at the corners of Arizona, New Mexico, and Utah:



The hole in the middle here is the [Hopi Reservation](#), and we'll also visit that, because we liked it a lot on our previous visit:

- John Baez, [Arizona](#), December 25-31, 2005.

On the first day we made it to [Kingman, Arizona](#), a town where the big east-west interstate Route 40 crosses the famous old highway immortalized by Nat King Cole's song: 'Get Your Kicks on Route 66'.





*If you ever plan to motor west
Travel my way, take the highway that's the best
Get your kicks on Route 66*

*It winds from Chicago to LA
More than two thousand miles all the way
Get your kicks on Route 66*

*Now you go through Saint Louis
Joplin, Missouri
And Oklahoma City looks mighty pretty
You'll see Amarillo
Gallup, New Mexico
Flagstaff, Arizona
Don't forget Winona
Kingman, Barstow, San Bernardino*

*Won't you get hip to this timely tip
When you make that California trip
Get your kicks on Route 66!*

We got gas at the Canada Mart and asked for a good hotel. Everyone in the store started chiming in, discussing a haunted hotel, one that had rooms named after old Hollywood stars, and so on. We wound up staying at a Best Western.

But the next day, Lisa went back to the Canada Mart and checked out their extensive selection of native American jewelry. Turquoise is used by the Navajo and Hopi, who mainly live at the eastern end of the state, but the best quality turquoise comes from Kingman... where the Mojave live. They call this town *Huwaalyapay Nyava*. Lisa bought a necklace, and the owner, Donna Hamera, threw in this piece of turquoise for free. Lisa gave it to me:



I love turquoise, but I didn't know what it actually was until I looked it up just now! It's a hydrous phosphate of copper and aluminum, $\text{CuAl}_6(\text{PO}_4)_4(\text{OH})_8$ with four H_2O 's thrown in. That's complicated!

December 22, 2012



Today we drove to the Navajo Nation. We took Route 40 east to Flagstaff and had lunch at Granny's Closet near the university. Then we cut north on 89 and drove through wonderful red rock country to the [Cameron Trading Post](#). It's fun to see and it has a cool-looking lodge, but it sells goods that are overly touristic and/or overpriced. I took this picture looking out from the trading post.

We continued north to Route 160, took a short drive east to [Tuba City](#), and spent the night at the [Moenkopi Legacy Inn](#). This is a beautiful but somewhat desolate hotel run by the Hopis, who live not in Tuba City proper—that's Navajo—but the adjoining town to the south, called [Moenkopi](#).

Fans of [Tony Hillerman](#)'s novels—and if you're not one, you should be!—will remember Tuba City. It's the largest town in the Navajo Nation, and it's named after [Tuuvi](#), a Hopi headman who converted to Mormonism. Apparently they couldn't even get his name right—or maybe it some other white folks who came along later were to blame.

December 23, 2012

Today after a bit of confusing we drove south and then west along Route 264 through the Hopi reservation. We saw lots of great landscapes, even before hitting the famous three mesas:











We stopped at a little store called the Monongya Gallery selling baskets and other goods. It was packed with people, quite a shock in this desolate landscape! Maybe it's because they were having a sale, with lots of stuff 40% off. They were also giving away cookies and coffee. Or maybe people just socialize by meeting at stores. We bought some great stuff at decent prices: some beautiful baskets (made in Mexico according to Hopi patterns, they admitted), and leather thongs for necklaces.



ARTISTS	MESA	PHONE
Abeita, Karen ●	First	(928) 737-0194
Andrews, Frederick ◆	Second	(928) 255-7652
Batala, Arthur ■	Third	(928) 734-2201
Cochwickia, Marcus ■	Second	(928) 380-6930
Dalangyawma, Ramon ■	Third	(928) 401-0153
Davis, Vincent ◆	Third	(928) 209-3047
Dennis, Leland ◆	Second	(928) 221-0543
Fredericks, Evelyn ◆	Third	(928) 255-2112
George, Michael ▼	Third	(928) 600-4755
Horyes tewa, Edward ◆	Second	(928) 734-9361
Horyes tewa, Iva ▶	Second	(928) 734-9361
Horyouti, Mavasta ◆	Third	(928) 637-5147
Lomayes tewa, Fernanda ■	Second	(928) 205-9656
Myron, Loretta ◆	Third	(928) 734-0061
Narnoki, Lawrence ●	First	(928) 737-2090
Narnoki, Valerie ●	First	(928) 737-0278
Quotskuyva, Frances ◆	Third	(928) 734-2050
Talahaftewa, Roy ■	Second	(928) 734-9262

● POTTERY ■ JEWELRY ▼ CARVING ▶ BASKETRY ◆ OTHER

GALLERIES	PHONE
1 Badger Spirit	(928) 283-4307
2 Hamana So'ohs	(928) 206-6392
3 White Bear	(928) 734-9298
4 Povi	(928) 734-9417
5 Talahaftewa	(928) 734-9262
6 Sewukiwma	(928) 734-0388
7 Iskasokpu	(928) 734-9361
8 Rising Sun	(928) 734-6665

The Monongya Gallery lists its address as P.O. Box 287, Old Oraibi, AZ 86039. Their phone number is 928-734-2344, in case you want to see if they're open. We also stopped at [Old Oraibi](#), which may be the oldest continuously inhabited town in North America. We'd been there on our last trip; it was just as run-down and desolate looking this time, with more dogs than people walking around. Still, it's definitely worth seeing. It has a small art gallery there, and my aunt bought some bookmarks there mainly out of sympathy with the owner. As we left, two old guys tried to sell us stuff, but we didn't buy.

Photography is against the rules at traditional Hopi villages, and we respected that at Old Oraibi. In better days it may have looked like this postcard:



We then proceeded to the nearby [Hopi Cultural Center](#). In the parking lot a young man, so soft-spoken I could barely hear him, sold me a [butterfly maiden kachina doll](#). I bought it out partially out of sympathy: making a living this way must be

hellishly hard. I hope he was just trying to get a few extra bucks. But I like it.

We had lunch at the center. Refried beans with lettuce and tomato on fry bread is called a Navajo tostada, tasty but fattening. It's not surprising most of the Indians we saw are obese—and diabetes is rampant here.

Eventually we reached Route 191 and Ganado, and cut north up Chinle, driving past mesas rendered red by the late afternoon winter sun.



We had dinner at a restaurant in Chinle. Then we drove to the Thunderbird Lodge and spent the night there, very near our goal: Canyon de Chelly.

December 24, 2012

We weren't sure we could find a Navajo guide who would take us down to the bottom of Canyon de Chelly on the day before Christmas! But they had the phone numbers for guides at the nearby Holiday Inn and we got in touch with one named Timothy who has ready to go right away. So, we drove down into the canyon's mouth:



The cliff walls gradually grew taller as we went deeper in:



Soon we reached Kokopelli Cave, which is famous for its petroglyphs:



Graffiti on natural rock is considered bad — but if it lasts a thousand years it gets called a 'petroglyph', and it becomes good.





Kokopelli is the hunch-backed flute player here. He's an important character in current-day Hopi mythology, but he goes back to their early ancestors, the ancient Pueblo peoples who built the cliff dwellings here. He's a fertility god, who carries unborn children on his back — and his music brings in the spring. The wiggly line is a snake: a symbol of earth and fertility.

The first cliff dwelling we saw was the aptly named First Ruin:



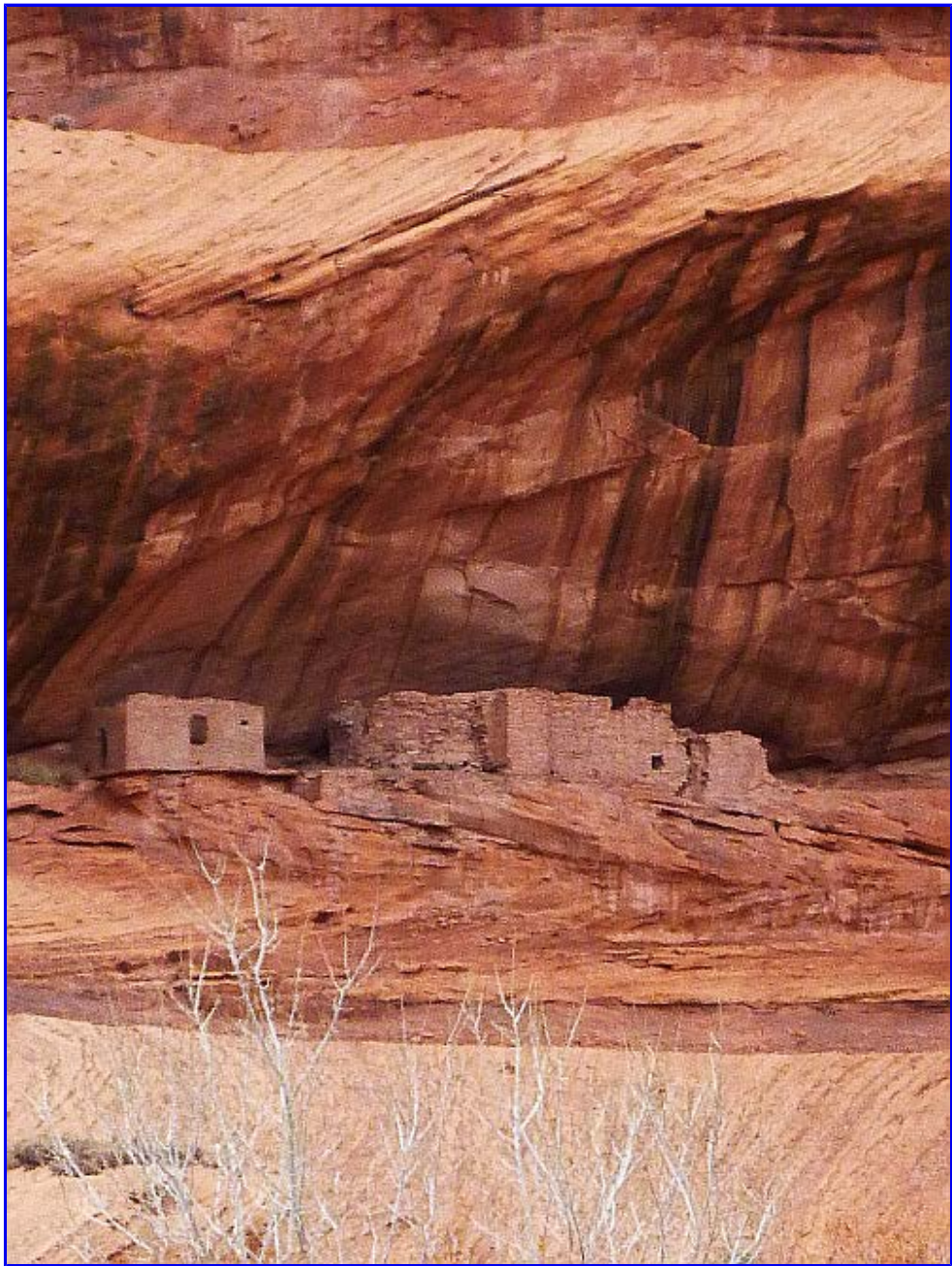


I've used computer trickery to add a blue sky to this and another picture taken today. In fact it was cloudy, and later it snowed! Click on this photo (or any other) for the true original version.

As we went deeper, the canyon walls got higher and the bottomland became full of cottonwood... as well as smaller weed trees like Russian olive that the Navajo were trying to eliminate because they suck up so much water it's hard to grow crops:



After a bit more driving we reached the junction between the northern and southern branches of Canyon de Chelly. There we saw the aptly named Junction Ruin:





Then we went south to the most famous cliff dwelling in the canyon: the White House Ruin. This is one you can walk to without a guide, so I'd seen it before, in [2005](#).













Then we drove back up to the junction and explored the north branch of the canyon. Timothy was very good at spotting deer lurking in the brush, like this one:



We passed some hogans, too. About 200 Navajo families live in the canyon during summer, growing crops on land they own here. But in winter they move to other homes, so we didn't see many people here, just small groups of horses and cattle.

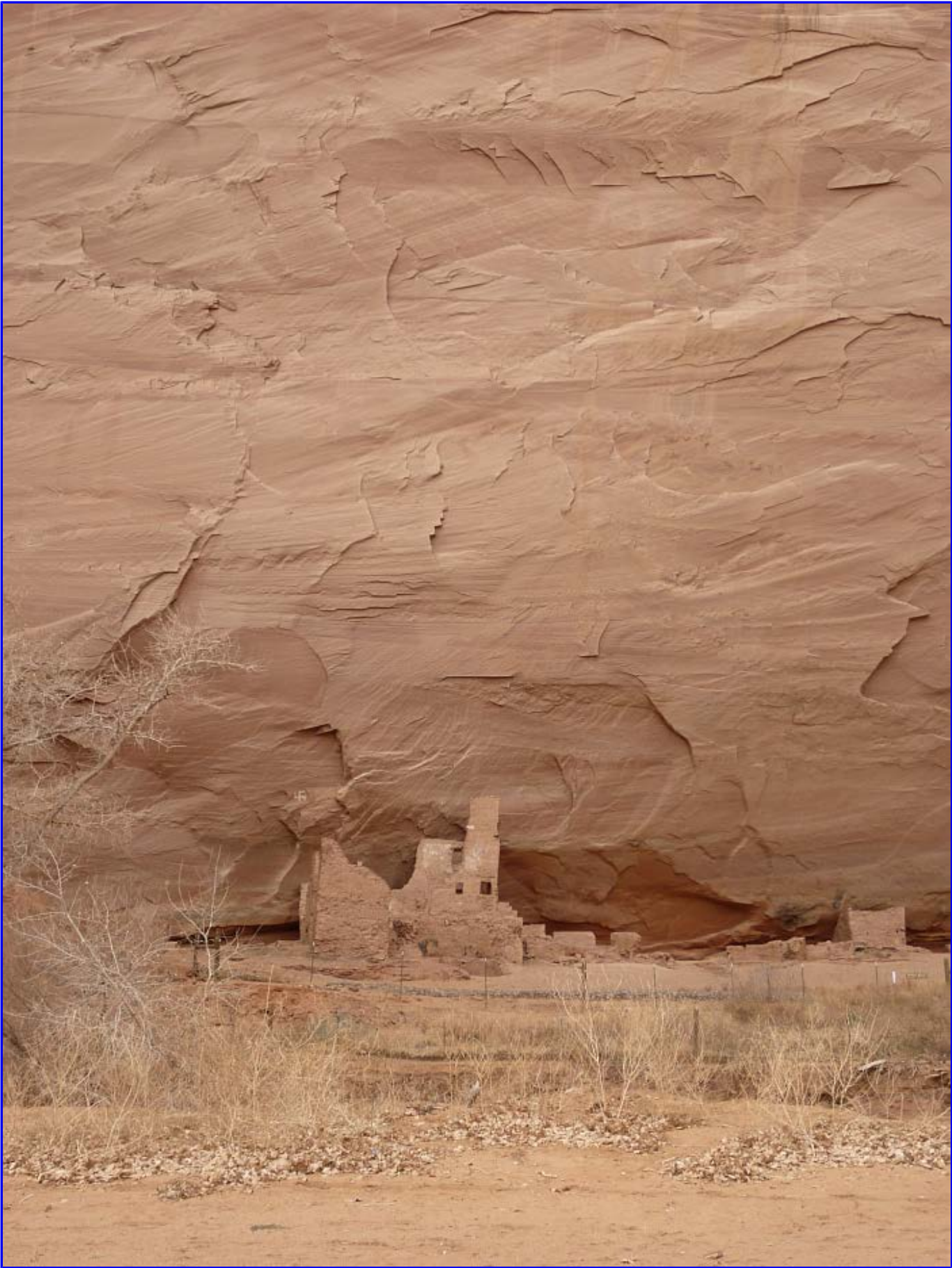


We then reached Martini Rock. Can you guess why it's called this?



Because it gives you a big hangover. 🤔

We then reached our destination in the northern branch of the canyon: Antelope House! It's named after the petroglyphs to be found here:





We then beat a hasty retreat as it began to snow in small flurries. We got stuck in the sand, so Timothy called his cousin, who was nearby, to pull us out. Cell phones make such a big difference out in the country!

We went home, had lunch. We took a little drive out through the snow to the southern rim of the canyon...



... but soon the snow started coming down in earnest, so our fear of getting stuck made this trip a short one.



I spent the rest of the afternoon organizing the photos here, while Lisa and my aunt shopped in the Thunderbird Lodge. Lisa

got some great moccasins to replace her old and worn-out slippers.



December 25, 2012

Almost everywhere around here is closed on Christmas day, except luckily the cafeteria at the Thunderbird Lodge, which serves blue corn pancakes to die for. They're so popular that if you order two they hand you a little blue sign saying BLUE PAN 2, which you take to your table!

I drove out through Chinle and south down Route 191, which takes a little jog east at Ganado, and then hits the big interstate 40 at the pathetically puny town of Chambers. I'm only disparaging this poor town because we were looking for some blue corn flour, and the only semblance of a grocery store there seemed to be a gas station, which had ordinary flour but no corn flour. The lonely-looking woman clerk said we could get some in nearby Sanders, to the east. We wanted to head *west*, but we went to Sanders... and found no blue corn flour at the grocery store.

So, we headed grumpily back west along Route 40, and got more grumpy when we reached the Petrified Forest National Park and discovered it was impossible to enter the park on Christmas. (Makes sense: you wouldn't want thieves making off with petrified logs while the staff were gone on holiday!)

I first heard about [Winslow, Arizona](#) in the famous song by the Eagles:

*Well, I'm a standin' on a corner in Winslow, Arizona,
and such a fine sight to see
It's a girl, my Lord, in a flatbed Ford,
slowin' down to take a look at me.*

But when we got there we mainly wanted lunch. A guy at a hotel said only two places might be open: the Turquoise Room and La Posada.



[La Posada](#) turned out to be a grandiose and really quite beautiful hotel built in 1929 by the Santa Fe Railway, and designed by [Mary Colter](#), a very good architect who also designed an amazing tower and some other structures I've seen at the Grand Canyon.

But when we went to the hotel restaurant, the maitre d' asked us if we had reservations. When we said no, he looked us up and down and said "Of course you don't." He explained that the only option on the menu was a \$50 multi-course Christmas dinner. We weren't in the mood for that, so we left after looking around. My aunt bought a mask at the very well-stocked gift store, and Lisa examined but didn't buy any Indian jewelry.

We got lunch much later, around 3 pm, as we were entering Flagstaff. Then we headed down south to Prescott, first along Route 19 and then cutting up along the 69. (The 169 would have been better, in case you plan to follow in our footsteps.)

We reached the historic downtown of Prescott a bit after dark, and parked to plan our next move. It turned out we were parked in front of another rather grandiose and charming old hotel, the [Hassayampa Inn](#), built in 1927. We decided to stay there! It was great fun.

December 26, 2012

We left rather early, hoping to get back to Riverside in one day's drive. We took Route 89 south through the Prescott National Forest. It turned to be a rather hair-raising ride, full of steep descents and hair-pin turns. Beautiful, but as the driver I couldn't risk too much gazing about.

At a little town called Congress we got gas and switched to Route 71. Beautiful view all over, but not too many good photos.



The 71 hit the 60 and we headed southwest on that until we hit the big interstate: Route 10. At this point it became familiar to me, since I've driven across the country many times, and this is one of the ways: through Quartzsite, through Blythe, then Indio, past Palm Springs, Banning, Beaumont, Moreno Valley and then home sweet home: Riverside.

But between Blythe and Indio, looking for a restroom, we stopped at a little town called [Desert Center](#). It turns out to be mostly a ghost town, though it has a population of 204. Of these two cafes, one has definitely been closed for years, while the other claimed to be "closed for repairs". A lonesome place, beautiful in its own way.



By the way, you can read more about the prehistory of Canyon de Chelly and the people who built in my [January 2013 diary](#)!

[For my January 2013 diary, go here.](#)

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