

## **CHAPTER FOUR, Astronomy**

### **The Road to 2001**

#### **From the sidewalk to the Moon**

I happened by San Francisco sidewalk Astronomers a few more times throughout the 90s. Dobson around 9th & Irving, and some of his students near the ocean above Sutro Baths ruins. [later I knew one was Bill Cherrington of the SFAA with a 16" Dob.] Catching outstanding views of the Moon and a crescent Venus. Dobson's telescope has the best optics — the Moon never looked better! Wishing I'd taken Dobson's telescope making class at the California Academy of Sciences, instead of the course at CCSF. Schedule limitations may have been a factor; I learned years later about how much John travelled to teach and lecture worldwide. At the time, I think it may have seemed difficult to deal with hauling big telescope parts around without a car, so I held off. It was on my to-do list for when the time is right.

#### **The old Planetarium of the CAS**

I loved spending days in the California Academy of Sciences in Golden Gate Park! I went frequently since Brian introduced me to the place in 1984. The whole interior was a wonderland of fossils, aquarium exhibits of amazing and exotic fish and amphibians, gems, earthquake demonstrations, and the fabulous planetarium!

This was an old school planetarium, like the one I first experienced in the Minneapolis public library. It looks kinda like a high tech mechanical ant, with lenses and light focusing projectors calculated from angles along its body. Shining pinpoints of light on the ceilings parabolic widescreen, encompassing our peripheral vision. The audience settles in the chairs that allows our necks to comfortably face our views upwards. As light dims and eyes adjust, the landmarks of the San Francisco skyline are silhouetted around the

entire circular periphery. Made of a cleverly constructed cutout of material that stands against a glow of light along the edge of the circular screen. [representing the San Francisco skyline circa 1960?] Made before there was a Transamerica pyramid, with other beloved structures visible of what characterizes our city — Coit Tower, The Palace of Fine Arts, Golden Gate and Bay bridges, the Embarcadero, to name a few standouts! A fabulous local design touch of this particular planetarium.

The stars, Moon and whatever planets would be up in the sky and visible at the time start to slowly appear above, as the speaker begins introducing his presentation. Welcoming us to the Morrison Planetarium, describing its function, leading to display what is currently in our night sky. It may be Saturn overhead by 9pm, or Mars at sunrise, pointing out the constellations showing as their backdrop.

Further dimming what down what would be urban light pollution, many more stars appear, with the accompanying constellations and how to find them, emphasizing Polaris — the north star. Back then, the presenter would usually be more professorial than entertainer, with q&a concluding the show.

It was an intimate, beautifully knowledgeable experience! I returned frequently, for differing information each visit if after a few weeks passed. By comparison, the new digital planetarium shows are mostly preprogrammed omni theater style movies, using recorded narration by famous actors. Astounding visuals with state-of-the-art CGI, all good for differing, current and popularizing presentation style, but often lacking the real time guidance of a knowledgeable speaker. I prefer the old school planetarium; calmer, still awe inspiring, and more in the moment. Ideally, both planetarium styles would be operating, possibly alternating to give the public both of these valuable journeys. Probably too impractical, but I'm not alone to miss the old setup.

## **The Exploratorium**

San Francisco's unique interactive science museum, and again Brian brought me there first. Then located at the Palace of Fine Arts — a fantastic, dramatic place to spend a day, and I certainly spent many in that gorgeous area along the bay. Exhibits vary widely within and outside the huge building. This is a creative hall full of do-it-yourself educational gizmo's, installations, contraptions, making minds buzz with nonstop curiosity.

### ***Everyone loves the Exploratorium!***

While not specifically Astronomy based, the custom built exhibits attract a similar spirit as handmade telescope building. This becomes manifest directly for me in the next chapter!

For now, a few of my favourite Exploratorium displays were :

- “The eye image of light flashing it at 1/250th a second, allowing you to see it in peripheral spurts, making wonder what is that eye neon I keep seeing? Where exactly is it?
  - The concave sound chambers ; talk to your friend across the room clearly, all by acoustic formations!
  - Pedal to turn light bulbs on; how much energy does it take?
- And a hundred or so more cleverly constructed, irresistibly fun interactive learning displays!

## **Cosmo Phase**

Sometime in 1992 I bought a fun wristwatch in Chinatown that was irresistible. A Casio *Cosmo Phase*, programmed to allow the wearer to view the solar system planets in their current positions - *and* - be able to zoom through 100 years of planetary positions! (depicted as small digital planet graphics that orbit within oval paths) - **AND** - shows a century of total solar eclipse dates — past and future! I totally nerded out about this find of miniature technology. And I was even more charged now for the next eclipse!

*When is the next one in North America?*

**2017.**

*Hmm, might have to do some overseas travel before then.*

## **My favorite mental nourishment : Science reading**

Taken by Richard Feynman's fun autobiography, "*Surely You're Joking, Mister Feynman!*", I decided to try his book on quantum electrodynamics, "*QED: The Strange Theory of Light and Matter.*" Challenging subject for a non-science major / artist getting his neophyte toe dipped in the hardcore stuff. I'd done so before, and even if much was beyond me, I truly appreciated gaining some kind of understanding through exposure. Feynman was the great explainer, and I loved deciphering his careful simplification of single photons journey in space-time demonstrated by Feynman diagrams. Electrons emitting and absorbing photons in bizarre ways compared to the macro world we observe. Amplify the quantity to form the quantum entanglement that makes up the construction of light itself! ! [My tiny summary does not explain it with justice. That is reserved for physics books. I'm merely reporting my memorable impressions.] I did read this again, reveling in the study, and the weird quality of nature at that scale. As above, not necessarily appearing as below! (and vice versa?)

I also really enjoyed science history books such as *Coming of Age in the Milky Way*\* by Timothy Ferris, who describes the development of scientific reason — regarding physics — with good clarity.

[\*illustrated by one of my favorite drummers, Prairie Prince!]

Stephen Hawking's *A Brief History of Time* was a good mindbender, designed more for layman consumption, it helped me to imagine what is going on in the universe!

Quoting Feynman : "*It's very hard to imagine all the crazy things that things really are like. Nothing is really as it seems.*"

**“Seven leather-bound volumes of Proust.”**

That’s what Stephen Hawking is quoted to have replied with after being asked what exists in a black hole!

Science reading provided more pragmatic mind food alongside my other main bibliophile obsession, *Remembrance of Things Past* [A la Recherche du Temps Perdu] by the inimitable realist of memories, with untouchably insightful descriptions of the world he knew around *fin de siecle* France; Marcel Proust.

## **Back to PBS in the 80's**

...where I was first exposed to Timothy Ferris in his documentary *Creation of the Universe*. Tracing then current physics theories and facts back to the earliest calculable moments after the big bang. Fascinating and informative. Brian video taped it, and I watched repeatedly, learning a bit more about the roads leading to the conclusions explained.

Another huge science history documentary of the mid-1980's is *The Day the Universe Changed* by James Burke — crackling with wit, historical enactments, visual travel destinations that spin around the globe, while Professor Burke points out uncanny connections between different —mostly accidental — inventions made across the centuries. His vivid and witty explanations had me alert with exclamation points popping out of the top of my brain!

Astronomical connections were illustrated, gaining enthusiasm for my college years curiosity. A great series!

## **Comets, partial eclipses, concerts under stars, ...**

"seeing a starry night sky makes me feel both calm and excited at the same time." To paraphrase what my sweetheart Alisa said around when we first met. From times of the mid-90's when I got busy with my digital design career, and married life soon after. We shared a million great memories over the next decade, of travel, hiking, camping, concerts, art...

My love for the night skies still going strong, Alisa and I spent quality times on road trips to excellent national parks for some unforgettably celestial nights. These were times of wanting a good telescope! The cheap refractor wasn't worth taking out. Binoculars were good for the time being, and of course the peripheral wide vision of our eyes (albeit bespectacled.)

## **Cosmic snowballs looping through space**

Specific events include the unexpected bright presence in the nightly urban sky of comet Hale-Bopp! This appears in early 1997, becoming the most visible comet that I have ever seen to date. Just a few months prior was the more predicted appearance of comet Hyakutake. Too faint to see in the city, but showed up in the dark areas of suburban Contra Costa County. One of the best sightings I had was near Moraga where my work office was located, for Midnight Design. One evening bicycling back to the BART station was a clear winter view showing comet with a faint yet visibly long tail! Magnitudes better than disappointing Halley's a decade earlier, so I was happy with this — but couldn't touch the visibility of Hale-Bopp a couple of months later. In urban light polluted San Francisco, Hale-Bopp hovered clearly, tail and all, for weeks! Everyone just hung out with the comet.

One particular evening, Alisa and I took a lovely stroll from our apartment on Fulton & 17th to catch the sunset over the ocean from a ledge above the Sutro Baths ruins — an area that we were very fond of. Out there on the edge of the land after a phantasmagorical sunset, the comet looking better than ever, the skies out there near Lands End are darker than the rest of the city, providing more ample contrast for celestial viewing. We stayed out with the comet for a good long time, the weather was windless and not too cold. The Pacific, calming and energizing, as was the comet hanging like a lantern ornament. We walked home very satisfied. *Unforgettable!*

## **Eclipse anyone?**

Only partials for us, with one good one seen through our front window on 11th @ Lake in 1999. But didn't get to Europe for the total that year. I really wanted Alisa to experience totality, but that year had schedule and financial issues. It was a short eclipse, making it less appealing, yet Europe itself was an important goal. (fortunately we made it there the following memorable summer!)

## **Y2K**

I started the year 2000 by painting a new style of Astronomy based artwork, inspired in a good part by the remarkable influx of full color Hubble telescope images, with an explorative brushwork and palette. A series of semi-abstract, psychedelic "Cosmos" paintings were begun that new years eve, with reel-to-reel tapes spinning all night long while I worked on the painting until sunrise. The long playing reels had a compilation of different live performances of *Dark Star* by the Grateful Dead. An astronomical theme, mostly from 1969; alternating with another reel of experimental electronic avante-garde musique also from the 60's. I found it an interesting futuristic yet retro style to herald in the 2000's!

## **Chronos continues**

I've been writing in roughly chronological order — *roughly*. The highlights are many throughout my 1990's, in forms I've mentioned regarding the cosmos; of scientific inspiration, artistic aspirations, observable contemplations, and furthering realizations about the wonders of deep space. The next chapter features the amplification of those qualities.

Enter 2001, leading to a *true* space odyssey.

~ Dean Gustafson, March 2021