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Prehensile paws and ridiculous gelatinous orbs:  
Attempting to connect on an astronomical scale when  
you are trapped in an absurd body

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MA Essay

KHiO, Kunstakademiet i Oslo / Oslo National Academy  
of the Arts, The Academy of Fine Art

*Prehensile paws and ridiculous gelatinous orbs: Attempting to connect on an astronomical scale when you are trapped in an absurd body*

*BLACK HOLE AT A TEAPOT'S SPOUT*

While flipping through a book on amateur astronomy, I came across a photograph of the night sky that contains the Sagittarius constellation. The asterism often used to identify this constellation is its 'teapot' shape, just as the Ursa Major constellation is recognized for its ladle or wheelbarrow-like shape. In this photo, near the tip of the spout of the teapot, was a small 'X' labeled "Center of the Milky Way Galaxy."

It had never occurred to me that you could know where it is, simply turn your head to it, and look to it. By now it goes without saying that we are within a spiral armed, disk-shaped galaxy, and I'd seen the silver band of the Milky Way across the sky probably a hundred times. It is in the nature of the shape that there must be a center, but there had never been a line drawn between that point and my self. When relying on the visible spectrum, there is too much dust and gas in the way to see the very center with the naked eye. However, there is an intense, point-like radio source, and by observing the motions of dust and stars surrounding it, astronomers inferred that it must be a supermassive black hole.<sup>1</sup> It even has a name: Sagittarius A\*.

That summer I lived on the coast of Maine. When you can find a break in the pine trees, there is crystalline sky. I had a seasonal job as a host in a restaurant, organizing the seating and taking drink orders from people passing through town. While driving home after closing the restaurant around midnight, I would look left through the driver's side window and there, at level with my

eyes, was the teapot and Sagittarius A\*. East-southeast, approximately  $12^\circ$  above the horizon. The center there, and my self here, drifting left and right over the yellow lines painted on the road.

In the mornings it was there behind me while I made eggs and toast, about  $-21^\circ$  below the horizon, west-southwest.

I decided to make a tracking device to follow the center continuously, 24 hours a day. Though the solar day is 24 hours long, everything else in the sky moves at a rate that equals 23 hours 56 minutes and 4.1 seconds, called sidereal time.<sup>ii</sup> I found a motorized telescope mount that, once calibrated to the north star and latitude, is able to track the speed and curvature of coordinates in the sky. For most of the northern hemisphere, Sagittarius A\* is usually below the horizon, so there would be no sense in attaching a telescope to the mount. For now, I am using a long wooden broomstick attached to the mount, to point at the center like a conductor's baton.

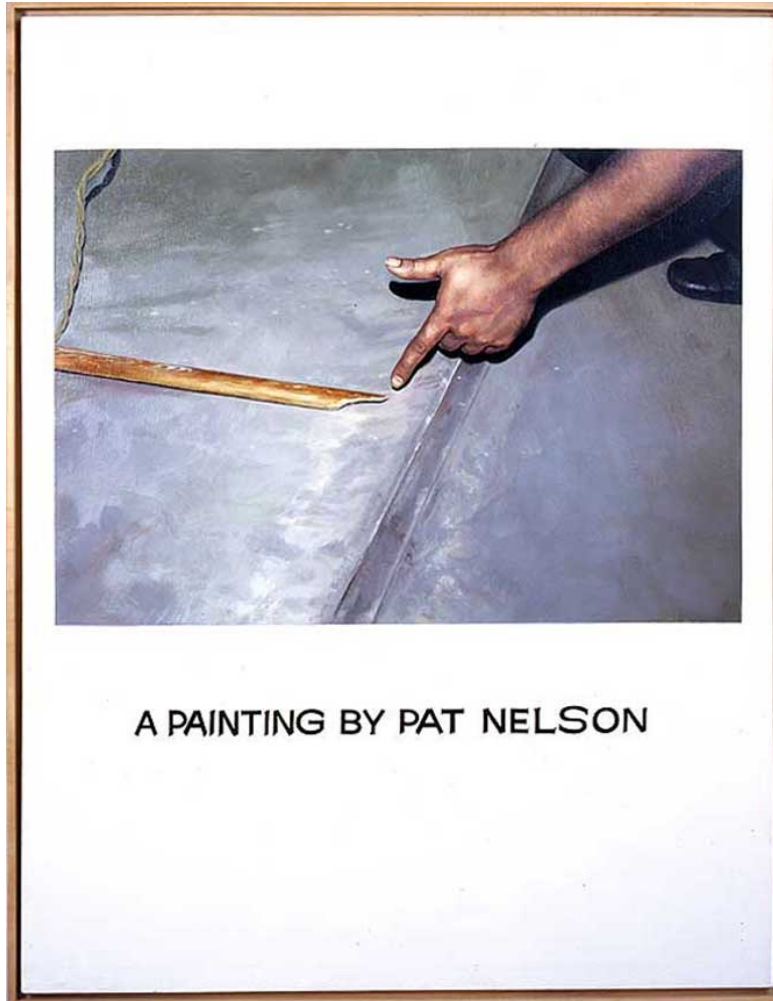


## *JUPITER*

Walking home on a cold night, I stopped to rest at the top of a hill and turned around to face the view. There was a suspiciously bright star, and for a moment I thought it might be an airplane. I stared for some time. It didn't move as a plane would, sitting supernaturally still, and not flickering as a star would. I realized finally—it was Jupiter. It has no surface, nothing solid as far as we can tell: the *gas giant*. All we can see is its swirling rust and cream colored atmosphere.

Passing down through the layers of clouds, at one level it would smell of ammonia, then below that is a rotten, sulfurous smell. Continuing further down, your body would whip around in the helium-neon rain, and eventually be crushed by the pressure. Suddenly there was a sharp cold sting, and smooth glassy pebbles—winter air on my teeth—and I was fumbled back down to where I stood on the frozen asphalt.

I tried to take a photo of Jupiter with my camera phone to document my finding, but it was hard to center and focus on the tiny white dot. My solution was to stretch out my arm, hand, and forefinger to point at it while taking the photo. After that night, it became a ritual: each time I spotted Jupiter I would point to it, closing one eye, and take a photo. I found myself noticing Jupiter from all sorts of places: from my bedroom window, looming above a graveyard, next to a sign for a falafel shop, hidden amongst holiday decorations in tree branches, or suspended between power lines.



John Baldessari, "Commissioned Painting: A Painting by Pat Nelson," 1969, Acrylic and oil on canvas, 59.25 x 45.25 in.

### *JOHN BALDESSARI AND THE MOON*

There is a series of canvasses by John Baldessari titled "Commissioned Paintings" from 1969 that each feature a photo-realistically painted image of a hand, pointing to miscellaneous features within its environment. Each of the paintings was executed by a different hired painter, and included the name of the painter (executed by another separately hired sign painter). For example, "A PAINTING BY PAT PERDUE," or "A PAINTING BY JANE MOORE," each inscription changing with the identity of the painter. (Hilariously, he instructed the hired sign

painters to “not try to make art out of it.”) He exhibited these works together so the viewer could compare the techniques of the painters, for example, how the extended forefinger in each was rendered. Baldessari’s choice of the imagery of pointing hands was in reaction to a quote by the abstract expressionist painter Al Held: “All conceptual art is just pointing at things.”<sup>iii</sup>

I have to agree with Al Held, and perhaps in an even more extreme way, in that pointing is all that is possible in *any* form of communication.

There is a parable from the Chinese Buddhist text *The Surangama Sutra* that uses a hand pointing at the moon as a metaphor for the inherent limitations of communication: consider the moon as a symbol of the ultimate, and only the act of pointing and following the point are possible.

Therefore, in some illustrations of this parable, the artists do not even include the moon, just the figure of Buddha Hotei pointing up.<sup>iv</sup>



## *HEADLIGHTS*

Due to the latitude of where I lived at the time, there was only a thin slice of the day when the atmosphere turned opaquely blue. Freezing temperatures settle any turbulence and humidity in the air. Far from any street lights, the only things left to see are off the planet.

My old 1994 Toyota Corolla had one manual knob that controlled all of the lights—both the headlights and interior cabin lights. On those nights, driving down straight stretches of empty road I would lean my shoulders forward till my eyes were above the dashboard, past the roof line, and turn the one knob all the way to ‘off,’ leaving complete blackness below the horizon. The car would disappear, and I reduced to only motion.

## *GLOBULAR CLUSTER*

Messier 13 (M13), is a globular cluster that can be located in the constellation Hercules, just above the star that delineates his right hip. I read that it's a good target for beginners because it can be located even with a pair of binoculars. Globular clusters are dense spherical gatherings of stars, and are often the most primordial of the galaxy; those in the Milky Way are estimated between 11 and 13 billion years old.<sup>v</sup> Pictures of the M13 cluster show what looks like a brilliant blue and gold firework, frozen mid-explosion, with unnatural looking symmetry. Thanks to the initiative of the local amateur astronomer's club, I signed out a 4.5"/114mm aperture Dobsonian style telescope—the “StarBlast.” (In low light, my own pupils are roughly 5mm, just under 1/4". I later measured for comparison against the telescope.) I was by my self out in the driveway, and for lack of a table I had set the telescope down on the asphalt, which was still radiating a bit of heat from the summer day. I located the constellation in the east, and pointed the telescope in the general area.

This telescope had a very basic mount system that could only be manually moved up, down, left, or right, which is counterintuitively difficult for tracking the natural curvature of the path. A flinch or spasm of my hand and the target darted out of sight. Once I figured out how to finesse the mount by steadying half my hand on the ground, I had to then figure out how to simply *look* through the viewfinder. I learned the hard way the mirages appear if you press your eye too hard on the lip of the eyepiece. Things seemed to blink in and out of existence.

I soon realized one of the mirages was in fact M13. It was nothing more than a dim, circular haze. A bit of mottling suggested the different points of light within. I suddenly felt silly, laying there on the driveway, hoping to see with my own eyes what was in the photographs. I rested my head down on the asphalt and pointed my eyes at the dark patch in the sky where it was.

## *RIDICULOUS GELATINOUS ORBS*

In the science fiction TV drama *Battlestar Galactica*, there are androids with synthetic biology—cybernetic, designed life-forms—called Cylons. They resemble humans identically, so much so that some do not even know they are Cylons. If their skin is cut with a knife, they would bleed red blood; the differences only emerge at the level of chemical composition. There is a scene when one of the Cylons confronts its human designers:

"I saw a star explode and send out the building blocks of the universe. Other stars, other planets, and eventually other life. A *supernova*, creation itself. I was there, I wanted to see it and be part of the moment. And you know how I perceived one of the most glorious events in the universe? With these ridiculous gelatinous orbs in my skull. With eyes designed to perceive only a tiny fraction of the EM spectrum. With ears designed only to hear vibrations in the air. [...] I don't want to be human! I want to see gamma rays, I want to hear X-rays, and I want to—I want to smell dark matter. Do you see the absurdity of what I am? [...] I know I want to reach out with something other than these prehensile paws, and feel the solar wind of a supernova flowing over me. I'm a machine, and I can know much more, I could experience so much more, but I'm trapped in this absurd body!"<sup>vi</sup>

Similarly, when we perceive the sky, we think and talk about it as a dome. This isn't because it is a dome, or because of the curvature of the planet, but because the lenses of our eyes are hemispherical and we have to roll our heads from left to right to take it in.<sup>vii</sup>

## DOGS

When gauging the intelligence of a dog, one test is the recognition of the pointing hand. Does it follow your gesture to that which you are pointing, or does it focus on the extended finger?

## *SOLAR SYSTEMS*

At the Norwegian Museum of Science and Technology, there was a section of the gift shop devoted entirely to the solar system. Hanging from the ceiling was an inflatable set of the planets, including even Pluto for posterity. They must have hung there for quite some time, as Saturn's rings were beginning to droop a bit. I considered buying it, but the colors and patterns seemed inexcusably off from how they actually appear in the visible spectrum. My aversion has its purpose, though: I'll admit that for many years I thought Saturn was cobalt blue with white rings (in reality it's all delicate shades of beige). Please know that this was long before I took an active interest in astronomy—and I direct the blame to inaccurate educational model sets.

Once back home, I spent some time browsing the internet for solar system sets, intending to compare the products with reality, in the colors and sizes. One hard-plastic set from the Smithsonian caught my attention for being proportionally accurate, though it received remarkably bad reviews—one customer was disappointed with the size of the set overall, with Jupiter being only the size of a golf ball, and another was irritated that the hangers were even bigger than the planets themselves. (Saturn was glow-in-the-dark acid green with orange stripes.) In another inflatable set, many of the planets were covered with bright camouflage-like patterns. Mercury's looked like stylized flames.

In one review of an inflatable Mars, a customer had returned it because they expected *The Red Planet*, and were disappointed with the rusty orange color.

In the end, I bought eight different sets, some inflatable, some hard plastic, and some that glow. In each, choices were made on a sliding scale between attempting to represent something accurately and making visually interesting objects. There is a need to spice the planets up a bit. I

plan to group all the like planets together: all the Earths, the Neptunes, the Saturns, etc., to compare solutions. Venus is also just a cloudy beige, and Mercury looks similar to our grey Moon.

(Technically, Venus, Jupiter, Saturn, Uranus, and Neptune can all glow on their own a bit, as they can have auroras at their poles much like Earth does.<sup>viii,ix</sup>)

## *AVERTED VISION*

Ironically, when looking through a telescope you can often perceive things clearer if you look indirectly, just off to one side or the other, using a technique called averted vision.<sup>x</sup> The concept is to concentrate on the target without looking directly at it. There are two types of light detecting cells in your eyes: rods and cones. The center of the retina is packed with cones, which are best at detecting color and very fine details. Rods, being most densely concentrated in a ring around the central cones, are specially suited for sensing dim light in peripheral vision.<sup>xi</sup> Because of this arrangement, the best way to see certain objects is by looking between 8° and 16° to the left or right.

There is an object, NGC 6826, called the “Blinking Nebula.” When staring directly at it in a small telescope you see only its central star, but with averted vision, a dim emerald green nebula blinks into existence around the star.



*MARBLE GRAVESTONES AND THE HUBBLE DEEP FIELD*

As a kid I remember taking crayons and newsprint paper to a local cemetery to make rubbings of the carvings on the headstones. There are common motifs: a skull with wings or crossbones, cherubs, an hourglass, or a willow tree shading an urn or lamb. As an adult, I once found in Vermont two weathered white marble headstones, each with a carving I had never seen before: a solitary, disembodied hand pointing straight upwards. The first hand was for a woman named Lovicy Mathers. It was wearing a striped sleeve and above, in a capitalized font, was carved the



phrase “GONE HOME.” The second hand, for a young man named Stowel Barnard, sat in a decoratively lobed niche with the caption “YONDER IS MY HOME.”

Lovicy’s hand and Stowel’s hand are pointing to wildly different homes. Once you factor in any inaccuracy in carving and the sinking of soft earth beneath the marble slabs, the pointing finger, as a tool, is a wholly inaccurate thing. Depending on the distance of what is being pointed to, a fraction of a degree of inaccuracy could land you in a completely different galaxy.

In 1996, the Hubble Space Telescope was pointed at a tiny section of the sky in Ursa Major that was believed to be completely empty. In the resulting image from the 10-day exposure, now known as the “Hubble Deep Field,” there were counted over 3,000 galaxies. The patch of sky was the size of a grain of sand held out at arms length.

After upgrades in 2004 that increased the sensitivity of the telescope, they opened the shutter for 11 days on a location near the constellation Orion, and counted 10,000 galaxies.<sup>xii</sup>

At the location of these headstones in Vermont (N 43°13’43.2”, W 72°53’54.3”), at the time of my writing this (February 7, 2016, 2:45pm, GMT+1), roughly 3° of inaccuracy in attempting to point straight up could land you in galaxies NGC 6695, NGC 6703, NGC 6686, NGC 6685, NGC 6675, or NGC 6702.



Hubble Deep Field site near Ursa Major

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<sup>i</sup> Stuart Wolpert, “UCLA astronomers solve puzzle about bizarre object at the center of our galaxy,” UCLA Newsroom, November 03, 2014, <http://newsroom.ucla.edu/releases/ucla-astronomers-solve-puzzle-about-bizarre-object-at-the-center-of-our-galaxy>

<sup>ii</sup> Not only are we spinning on an axis (which creates the ‘solar’ day) we are also on an elliptical path around the sun. The combination of the two motions creates the seasonal shifts in the constellations—those visible at nighttime in the winter will be in the daytime sky during the summer. “Positional Astronomy: Sidereal Time,” School of Physics and Astronomy at the University of St. Andrews, November 2003, <http://star-www.st-and.ac.uk/~fv/webnotes/chapter6.htm>

<sup>iii</sup> John Baldessari, *More Than You Wanted to Know About John Baldessari, Vol.1*, edited by Meg Cranston and Hans Ulrich Obrist (Zurich: JRP|Ringier, 2013), pg. 60-63

<sup>iv</sup> Neal Dunnigan, *Pointing at the Moon*, (Morrisville, N.C.: Global Thinking Books, 2014), pg. 177

<sup>v</sup> “Globular Cluster,” Encyclopedia Britannica, November 5, 2014, [www.britannica.com/topic/globular-cluster](http://www.britannica.com/topic/globular-cluster)

<sup>vi</sup> “No Exit,” *Battlestar Galactica*, Season 4, Episode 15, U.S. air date February 13, 2009

<sup>vii</sup> E. H. Gombrich, “The sky is the limit: The Vault of Perception and Pictorial Vision,” *Perception: Essays in Honor of J.J. Gibson*, (Ithaca N.Y.: Cornell University Press, 1974).

<sup>viii</sup> Gilda E. Ballester, “Jovian Planets: UV studies of their upper atmospheres and magnetospheric interactions,” Lunar and Planetary Laboratory at the University of Arizona, January 6, 2010, <http://vega.lpl.arizona.edu/~gilda/jovianplanets.html>

<sup>ix</sup> “Shining a light on the aurora of Mars,” European Space Agency, November 5, 2015, [www.esa.int/Our\\_Activities/Space\\_Science/Mars\\_Express/Shining\\_a\\_light\\_on\\_the\\_aurora\\_of\\_Mars](http://www.esa.int/Our_Activities/Space_Science/Mars_Express/Shining_a_light_on_the_aurora_of_Mars)

<sup>x</sup> Robert Bruce Thompson and Barbara Fritchman Thompson, *Astronomy Hacks*, (Sebastopol, C.A.: O’Reilly Media, 2005), pg. 79-80

<sup>xi</sup> Terrence Dickinson, *NightWatch*, (Buffalo, N.Y.: Firefly Books, 2006), pg. 93

<sup>xii</sup> “Hubble Digs Deeply, Toward Big Bang,” National Aeronautics and Space Administration, December 4, 2007, [www.nasa.gov/vision/universe/starsgalaxies/hubble\\_UDF.html](http://www.nasa.gov/vision/universe/starsgalaxies/hubble_UDF.html)