The Secular Circular

Newsletter of the Humanist Society of Santa Barbara

www.SBHumanists.org **JUNE 2022**

Come One Come All!
To The Return of the Humanist Society of Santa Barbara's
Annual Summer Solstice Picnic

Come join us for a picnic at Stow Grove Park, 580 North La Patera Lane, Goleta at Area 2 on **Saturday, June 18 at noon**.

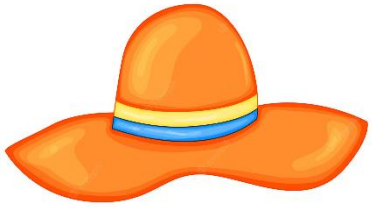
Bring a dish to share. We will provide chips, dip, and beverages.

Note that Area 2 has no shade so bring a hat or maybe even a parasol. Look for our HSSB banner and feather flag.

To be more environmentally responsible, we ask that you bring your own plates and flatware. Don't panic if you forget as we will have paper plates and disposable cutlery available.

Invite a friend who might be interested in meeting us and joining HSSB. We ask for a $5 donation per person (or whatever your generous spirit feels like contributing) to help defray costs.

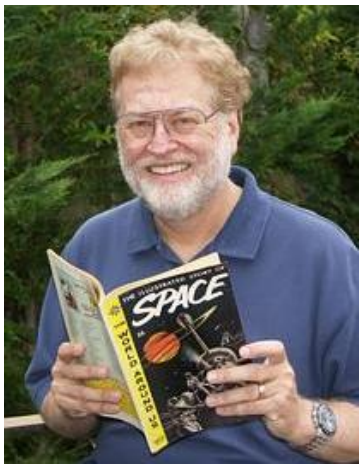
Fun and games will be provided so **bring your thinking caps with you**. Looking forward to seeing you there!



RSVP to: judithannfontana@yahoo.com

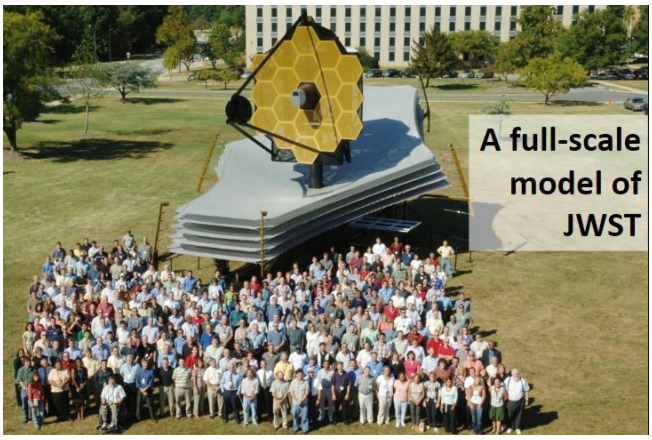
Dr. Roger Freedman: Seeing Into The Cold
5/21/22
By Robert Bernstein

Full disclosure: Exploring and understanding the wonders of our universe sits at the top of my list of what gives meaning to life. If you missed this talk, [view the video here](#).



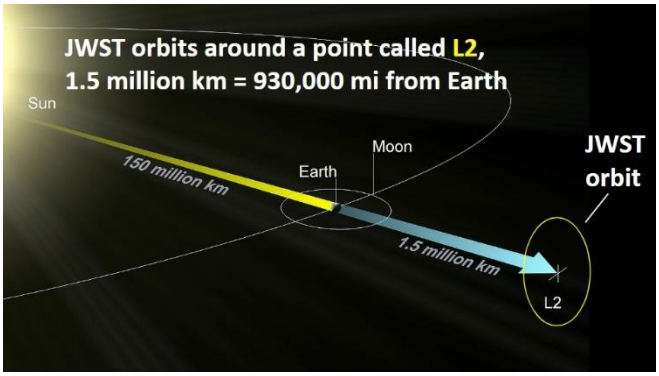
UCSB Physics Professor Emeritus, Roger Freedman held our attention as he explained the wonders and understanding that the James Webb Space Telescope (JWST) will give us.

The JWST launched 25 December 2021 after many delayed launch dates going back to 2016. Freedman showed us NASA's concept for the "Next Generation Space Telescope" in 1989, notably, while *Star Trek: The Next Generation* was still being produced!



He showed the scale of this massive scientific instrument with a photo of a full scale model surrounded by a crowd of people. The mirror is 24 feet across. JWST is the largest telescope ever placed in orbit.

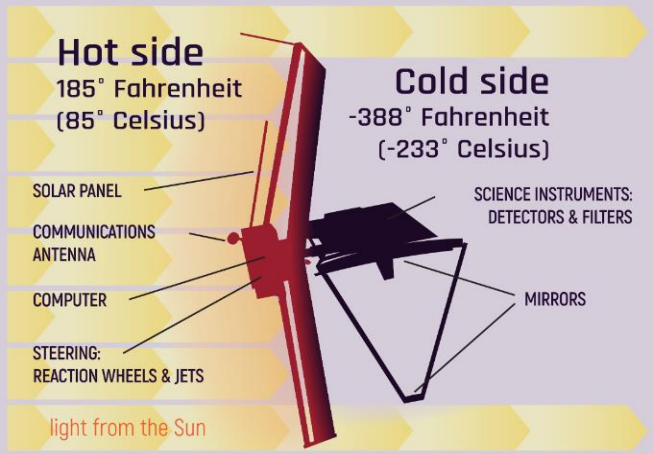
And this is no ordinary orbit. We usually think of low Earth orbit for such instruments as the Hubble Space Telescope (HST). The HST orbits at just 340 miles above the Earth. It was placed in orbit by the Space Shuttle Discovery in 1990 and has been serviced by five Space Shuttle missions.



In contrast, the JWST is at a point in space called Lagrange Point 2 (L2 for short) about 930,000 miles from Earth! Over 4 times the distance to the moon!
L2 lies beyond the Earth's orbit around the Sun. Objects at L2 orbit the Sun while the

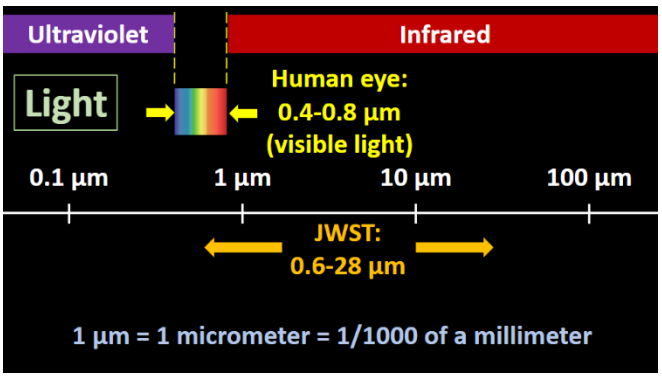
gravitational pull of the Earth keeps it at a constant distance from the Earth.

The JWST actually orbits this L2 point. Orbital mechanics is an application of the basic physics of Newton, but it is full of wonderful surprises! This orbital space is big enough that it is not at risk of hitting other spacecraft or other objects near L2. Why have it so far away? At this distance, no spacecraft could get there to service it.



One side of the JWST will always face the Sun and will be at the toasty temperature of 185 degrees Fahrenheit. Its cold side will be at the frigid temperature of minus 388 degrees Fahrenheit, which is colder than liquid nitrogen. All the instruments are located on this cold side.

In a word: "Infrared". Visible light spans the spectrum of wavelengths from 0.4 to 0.8 microns. Infrared has a longer wavelength.



Oven heaters put out infrared. We experience infrared as heat radiation. The JWST can "see" infrared in the range of 0.6-to-28-micron wavelengths.

To be able to see what it is looking for, the JWST is shielded from heat as much as possible. Orbiting L2 keeps both sides of the JWST at a stable temperature.

Freedman showed us how an infrared camera can see a man's arm inside a black plastic trash bag. Infrared can pass through material that blocks visible light including dust and certain gases in space.

He noted that some materials that are transparent to visible light (such as the man's glasses) will block infrared. This includes glass and the Earth's atmosphere.

This phenomenon is what causes the "greenhouse effect" that keeps the Earth warm: Visible light passes right through the atmosphere and heats the Earth. This heat is re-emitted as infrared, but is blocked by the atmosphere, trapping the heat as if the atmosphere were a blanket (This greenhouse effect is also what is causing the Climate Crisis as more carbon in the atmosphere increases this effect.)

This also explains why an infrared telescope needs to be placed above the atmosphere.

Herschel and Spitzer were earlier orbiting infrared telescopes. Since they were in low Earth orbit, they needed to be refrigerated with helium refrigerant, which eventually ran out. Some data could be taken for another 15 years, but it was not suitable for many purposes.

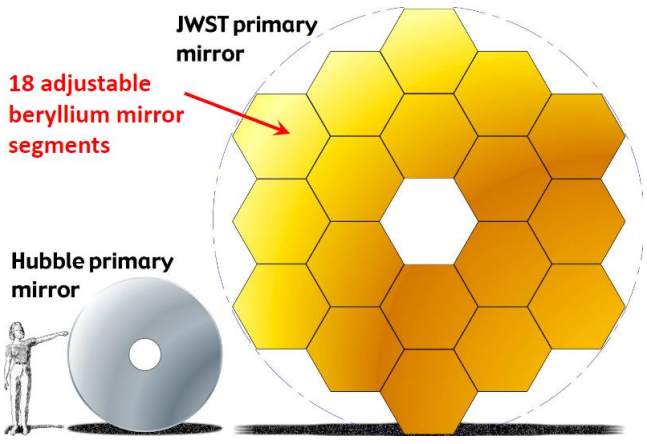
Due to its location, the JWST is cooled passively with a giant shade structure. This shield is the size of a tennis court! It has five layers of shielding with gaps in between. It is the equivalent of SPF 1000 sun block!

The shield is made of KAPTON polyimide film. It is strong, light-weight, and flexible. It can be metallized to make it highly reflective.

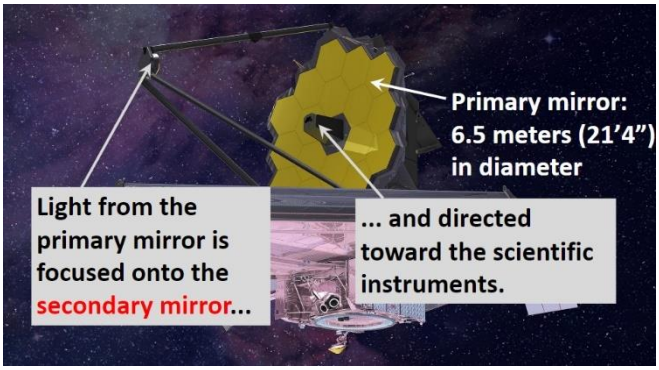
The JWST structure is very complex and had to unfold in many stages. I personally was concerned that such a complex mechanism might not work. Did I mention there would be no way to go out there and fix it if it did not unfold properly? And that would effectively end the mission? I am very happy that I was wrong and that it unfurled perfectly!

The JWST has enough propellant to make minor adjustments to its position. Its position around L2 keeps its orbit quite stable.

The JWST 24-foot mirror is comprised of 18 adjustable mirror segments. A bigger mirror gathers more light from faint objects which results in sharper images. The Hubble Space Telescope had a single mirror that was made with a slightly incorrect curvature which was repaired later in a risky mission.



Since the JWST's 18 mirror segments are individually adjustable, similar problems could be fixed later. Did I mention it is really far away and can't be visited by repair astronauts? Using 18 segments also allowed each segment to be optimized during manufacturing.

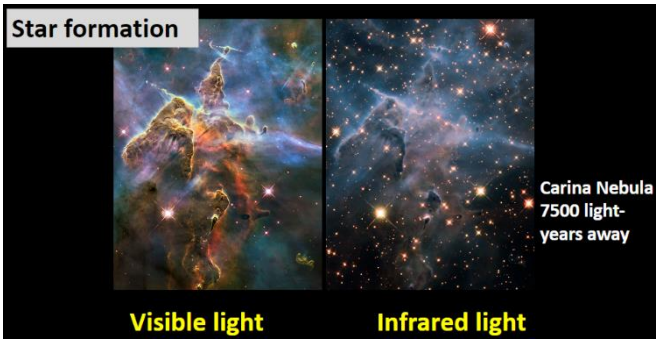


The 18-segment mirror is the "primary mirror". Light from this mirror hits a secondary mirror on a boom which then directs the light to the instruments.

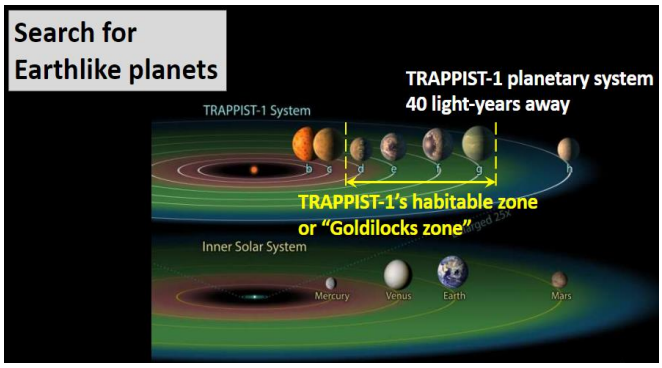
The resolution of this precision instrument is equivalent to seeing a penny 40km away!

The JWST has been up for almost six months. What will we learn from the JWST? It can see through the gas and dust of regions where stars are forming. Freedman compared it to viewing a baby with ultrasound.

He showed an image of the Carina Nebula 7500 light years away, which is just such a "star nursery".

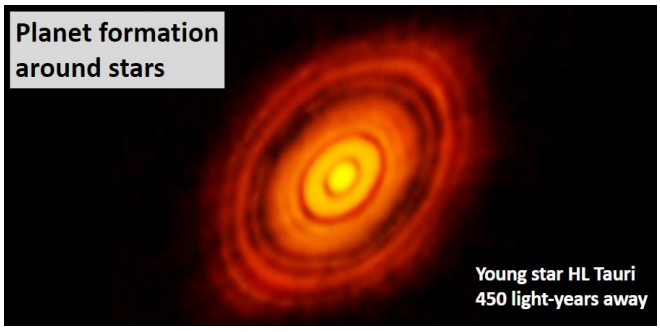


The JWST can also look for Earth-like planets. He showed the TRAPPIST-1 planetary system 40 light years away. These planets orbit so close to their sun that they are all closer than Mercury is to our Sun. That sun is dimmer than ours such that four of those planets are in the "Goldilocks Zone" where life as we know it could survive.



Even more valuable: The JWST can look at light from a star passing through the atmosphere of a planet. The spectral components of the light provide clues about the composition of the atmosphere and whether it contains materials created by living things.

The JWST can also look for planets forming around stars. He showed us HL Tauri which is just 100,000 years old and 450 light years away. It is disc shaped, similar to the shape of our solar system at the time our planets were forming.



Dr. Freedman also made the point that since the universe is expanding, wavelengths of light reaching us from far away are being stretched out, or red-shifted, from the visible light region of the spectrum. An infrared telescope can capture this red-shifted light.

Finally, the JWST will be able to look far out in space, meaning far back in time. This, because light from so far away began its journey long ago. The JWST will be able to look back 100 million to 250 million years after the Big Bang. This is a time when the first stars and galaxies were forming. We don't have these pictures yet, but JWST should give them to us in the coming years!

HSSB President Judy Flattery began the Q & A by asking if the hexagonal segmented mirror introduces image distortion. Freedman compared it to covering half of a shaving mirror. It dims the image, but introduces no distortion. He said the mirror is made of beryllium, which is very light weight, very reflective to infrared, and also very toxic!

Judy added that she and husband Dave worked at the KAPTON manufacturing plant in Circleville, Ohio in the late '90s (Dave provided technical support to manufacturing while Judy was KAPTON product manager for electronic applications).

She went on to ask about the expansion of the universe. Can the universe expand faster than the speed of light?

The answer: Yes, objects can separate from each other faster than the speed of light if they are far enough away from each other in the universe. Freedman said the rate of expansion has changed over time. For a while the expansion was slowing, as might be expected given the effect of gravity, but mysterious "dark energy" seems to be causing accelerated expansion now.

When asked about the coordinate system used in space (given that everything is moving with respect to everything else), Freedman said that the frame of reference astronomers use for the

entire universe is actually the Earth's north and south poles! This system has its limitations in that the direction of Earth's axis is not fixed; it slowly drifts and so the coordinate system gets updated every few decades.

What about background noise? Yes, there is background noise. This is subtracted out using a dark exposure as a reference.

Star Trek or *Star Wars*? He likes both. As a kid in the 60s he even watched *Lost in Space*. There weren't as many SciFi choices then as there are today.

Wayne asked if the KAPTON on JWST is covered in gold? No, actually, it is aluminized.

Donna wanted to know when we will see images. Not sure. Freedman explained that astronomers put in viewing requests and then receive data. Then grad students do the tedious analysis work. The results are embargoed to get papers published (and to get proper credit).

Is there a color standard for visualizing infrared images? No, there is no standard "false colors" for infrared images. JWST images may create a new standard.

Gordon noted that an accurate launch gives added life to the mission as fewer propellants are needed for course corrections. Freedman agreed. He noted that this was a very heavy payload. Launching it from French Guiana near the equator gave it an extra boost from the Earth's rotation.

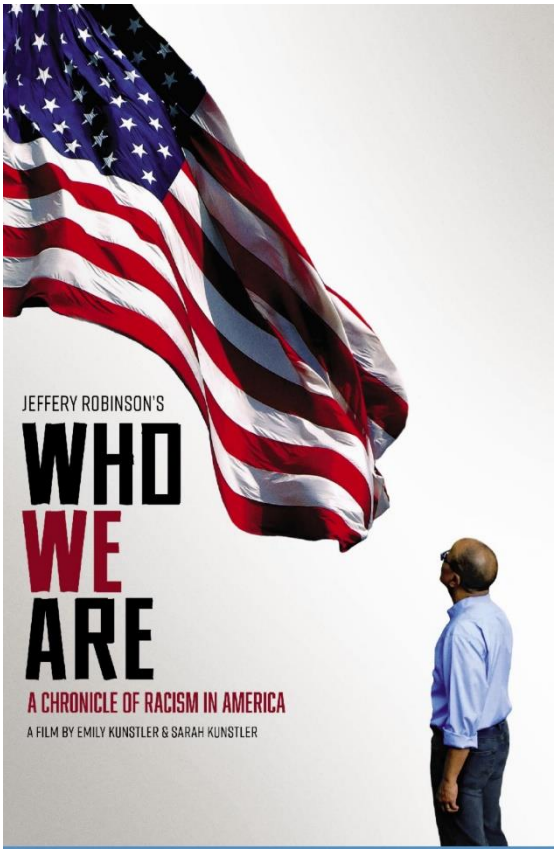
Wayne posted this NASA link for keeping up to date with the latest from the JWST.

The Who We Are Project

By Judy Flattery

On May 26, I participated in the first of a series of five discussions hosted by UC-Irvine and Orange County Human Relations based on the movie *Who We Are: A Chronicle of Racism in America.*

This documentary explores the role of white supremacy in the founding and history of our nation and shows how slavery's legacy has led to persistent racial inequality. The movie is based on a series of lectures given by Jeffery Robinson over the past 10 years. **I highly recommend this movie.**



Jeffery Robinson is the founder of the *Who We Are* project. The name of the project comes from the oft repeated phrase voiced by leaders after some tragic event or revelation, "This is not who we are".

Robinson makes the point that, well, yes, actually, this IS who we are, and who we have been. Maybe not acknowledging this is related to why "these things" keep happening.

Perhaps this is not who we aspire to be. Perhaps if we are willing to confront and explore all our history, true reconciliation may

be possible. George Orwell warned us that "Who controls the past controls the future." Telling the truth about and accepting the past can make a new future possible for America.

Jeffery Robinson is the founder and executive director of the Who We Are Project. Until April 2021 he was the ACLU deputy legal director and the director of the ACLU Trone Center for Justice and Equality. A graduate of Marquette University and Harvard Law School, he has three decades of direct experience working on these issues.

Upcoming interactions with Jeffery Robinson based on the themes from the film are available on Zoom. I invite you to watch the movie and/or participate in these free Zoom events on the following topics. The movie is available on Amazon Prime Video. It is helpful (but not necessary) to see the movie before attending one of the Zoom events.

The registration links for each discussion session are listed below. A private Zoom link will be emailed to you by OC Human Relations after you register. Hope to see you there!

Education Systems, June 8, 2022, 5- 7pm
https://conta.cc/3KP3hxs
Contributions & Celebrations, June 22, 2022, 5pm to 7pm. https://conta.cc/3JFG6UQ
Systemic Racism, July 6, 2022, 5pm to 7pm
https://conta.cc/3uL0rnp
Relationships & Allyships, July 20, 2022, 5pm to 7pm https://conta.cc/3M75nJ9

Wise men speak because they have something to say; fools because they have to say something. -Plato

Calling Bullshit: The Art of Skepticism in a Data-Driven World

By Judy Flattery

On May 26, I also attended a Zoom event sponsored by the Center For Inquiry featuring Carl T. Bergstrom and Jevin T. West discussing skepticism and how to identify "bullshit".

They say, "Bullshit involves language, statistical figures, data graphics, and other forms of presentation intended to persuade by impressing and overwhelming a reader or listener, with a blatant disregard for truth and logical coherence.

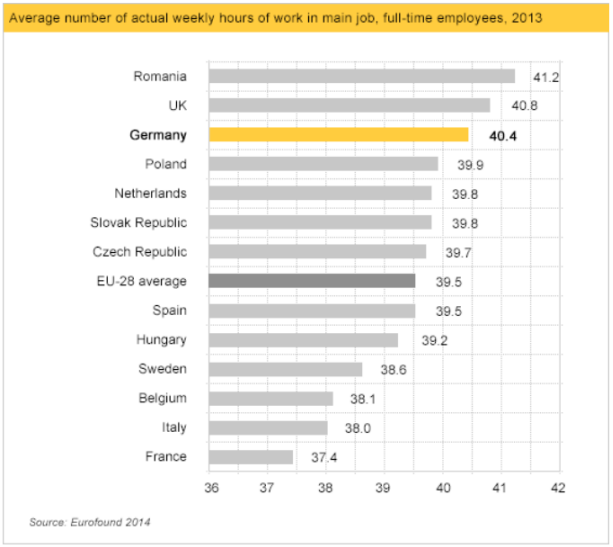
"Calling bullshit is a performative utterance, a speech act in which one publicly repudiates something objectionable ... You can call bullshit on bullshit, but you can also call bullshit on lies, treachery, trickery, or injustice."

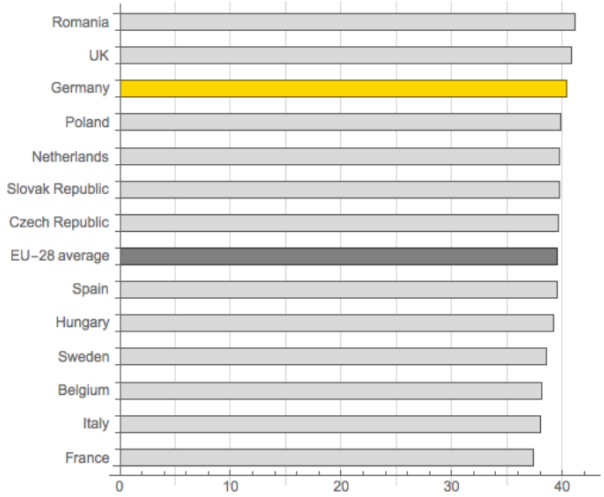
Some of the key points I gleaned from this talk:

1. Read laterally. This refers to checking on the validity of information by reading various sources rather than diving deep into a single source or a single perspective. Compare different perspectives. Watch out for falling too deep into a single rabbit hole.
2. Consider the source of information. Who is telling me this? How do they know this information? What are they trying to "sell me"? Demand context and make relevant comparisons.
3. Consider the input data and the output conclusions. We may not have the expertise to evaluate the complicated data calculations and manipulations between input and output but we can check to see if there might be selection bias in the data input and if unwarranted conclusions are being drawn from the data output. They shared examples of a research papers where the authors were careful to point out that correlations in the data did not prove a causal relationship, but later the press disregarded the conclusion and touted a causal relationship.

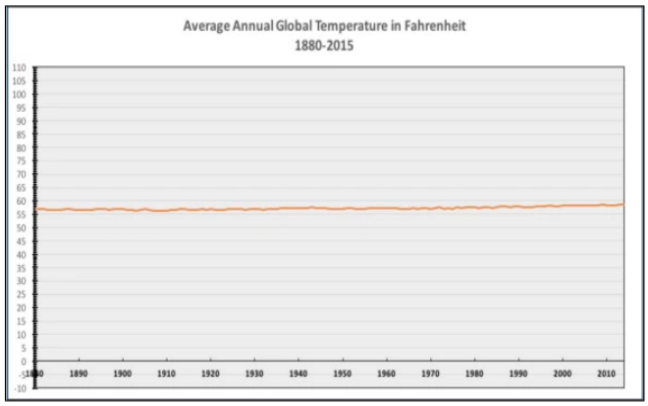
4. Look at graphs carefully. Spot misleading axes. They showed common ways of misrepresenting data such as bar graphs which accentuate differences by not starting at zero or line graphs which minimize real change by showing a larger range than is appropriate. Consider if the presenters of the graphs are purposely manipulating the axes to support a particular point of view.

Here is an example of a misleading bar graph from their website published by the German economic development agency, claiming to show how much more motivated German workers are compared to other European countries; however, if the full width of the bars are included, the difference seems much less significant. Bar graphs should include 0.

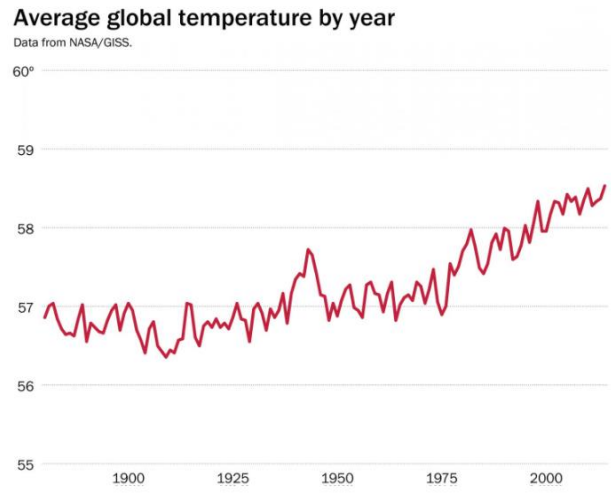




On the other hand, line graphs need not include "0". Below is a graph trying to make the point that climate change is not a serious concern by showing average global temperature over the past century on a graph with an inappropriately broad Y-axis. This was created by bloggers at Powerline and tweeted by The National Review in late 2015. The Y-axis extends from -10F to 110F minimizing the increase in Earth's temperature.



If, these data are plotted with a tighter range the graph looks like this:



Much more is available on their website and in their book. They welcome submissions of other examples of misleading data representations: https://callingbullshit.org/ and their book, *Calling Bullshit: The Art of Skepticism in a Data-Driven World.*

Shen Yun at the Granada

By Judy Flattery

The Shen Yun performance at the Granada featured beautiful choreography, talented performers, and high production value. However, I learned that this heavily promoted entertainment event is produced by and financially supports the religious sect Falun Gong, founded in the early 1990s and banned in China as a cult. I was particularly dismayed at a line in their keynote song, "I Sing of the Sacred" which went "Heed not the mad doctrines of atheism and evolution. Modern thought and ways lure one towards Hell".

Upcoming On-line Events of Interest to Humanists

- June 13 (and every Monday): That GD Show hosted by Dave Warnock & Genevieve. 6:00-7:30 pm. Live show link on YouTube. Call in to the show at 217-375-9933.
- June 18: Webinar on Banned Books – Censorship on the Rise, largely driven by religious pressure. Americans United for Separation of Church & State – Orange County, 4-5:30 pm. On Zoom.
- June 21: Wayne Laufert: Speaking of Humanism: *Behaving Decently: Kurt Vonnegut's Humanism.* American Humanist Association presentation. Wayne Laufert
- June 22: Virtual Lobby Day: American Humanist Association is partnering with American Atheists to co-host Virtual Lobby Day, an opportunity to advocate for issues we care about in a friendly and empowering environment.
- June 24-26: American Humanist Association 81st Annual Conference. On line virtual conference. AHA 81st Annual Conference

HSSB Contact Information

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President: Judy Flattery, sbhumanisteditor@gmail.com

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Treasurer: David Flattery, david.flattery@post.harvad.edu

Board Members at Large:

Wayne Beckman, Robert Bernstein, Mary Wilk, Jules Bender, Judith Fontana, Hugh Smart

Newsletter Editor & Submission Deadline

Judy Flattery, sbhumanisteditor@gmail.com

Deadline for submissions to the Secular Circular is midnight, the last day of each month. Our web site, www.SBHumanists.org, archives current and past issues of the *Secular Circular.* Non-members may subscribe to hardcopy of this newsletter for an annual fee of $20. E-mail copies provided to members and interested non-members at no charge.

To Join or Donate to HSSB: Annual Membership dues are $36 for an individual, $60 for a couple, $100 for a Society Supporter, and $300 (or more) for a Society Patron. Dues payments and other donations can be made via PayPal (**Paypal.me/SBHumanists**) or check. Include your name and contact information when submitting payments. Make checks out to *Humanist Society of Santa Barbara* and mail to Mary Wilk, P.O. Box 30232, Santa Barbara, CA 93130. For further membership information contact Mary Wilk at mwilk@cox.net.

Join our Facebook Group. Watch our speaker videos on YouTube. Subscribe to our Meetup page to be notified of upcoming events.

Humanist Society of Santa Barbara
P.O. Box 30232
Santa Barbara, CA 93130

HSSB Calendar

Tuesday June 14, 5:00 p.m. HSSB Board Meeting. Join as early as 4:45pm for socializing. Zoom link: https://us02web.zoom.us/j/83592300667. Members always welcome to attend.

Saturday June 18. HSSB Summer Solstice Potluck Picnic. Stow Grove Park. Area 2 which has no shade so bring a hat or maybe a parasol.12 pm Noon. Potluck: Bring a dish to pass and your own cutlery. $5 donation requested. Open to members and interested non-members. RSVP to Judy Fontana via email at judithannfontana@yahoo.com

Tuesday July 12, 5:00 p.m. HSSB Board Meeting. Join as early as 4:45pm for socializing. Zoom link: https://us02web.zoom.us/j/83592300667. Members always welcome to attend.

Saturday July 16, 3:00 p.m. *U.S. Imperialism and the Sanctuary Movement in Los Angeles.* Professor Mario T. Garcia, UCSB Chicana & Chicano Studies. Zoom link: https://us02web.zoom.us/j/88193881833.

Tuesday August 16, 5:00 p.m. HSSB Board Meeting. Join as early as 4:45pm for socializing. Zoom link: https://us02web.zoom.us/j/83592300667. Members always welcome to attend.

Saturday August 20, 3:00 p.m. *Darwin's Impact on Science Education.* Dr. Andy Thomson, MD, psychiatrist, University of Virginia. Zoom link: https://us02web.zoom.us/j/88193881833.