



NMSR Reports

The Newsletter of the
New Mexicans for Science and Reason

NMSR Reports, David E. Thomas, Editor, 801 Fitch Ave., Socorro, NM 87801 © 2018

FEBRUARY MEETING:

NEW MEXICANS FOR SCIENCE
AND REASON WILL HEAR

Valorie Aquino

on "Organizing March for
Science: From Moment to
Movement"

7:00 PM February 21st, 2018

==>**CNM MAIN CAMPUS,**
Student Resource Center<==

==>Room 204<==

Bring a friend!

March for Science on Earth Day 2017, founded MFS-ABQ, a TEDxABQ 2017 speaker, and recipient of the American Anthropological Society 2017 Executive Director's Award. She is an anthropology Ph.D. candidate at UNM whose work reconstructs paleoclimate and cultural records in the ancient Maya world, and has contributed to publications in Science and Nature journals.

Coming on March 21st (a week later than usual, *again*) : "Life, elevated" with hummingbird biologist Chris Witt. Chris is an Associate Professor at UNM, and got his Ph.D. in Biological Sciences at Louisiana State University in 2004. His research interests include Avian systematics and molecular evolution; evolutionary inference using phylogenetic comparative methods; biogeography of the Neotropics; hummingbird evolution and comparative physiology; high-altitude adaptation; integrative ornithology.



FUTURE MEETINGS ANNOUNCED



Feb. 21st, 2018 (*a week Later than usual!!*): Valorie Aquino on "Organizing March for Science: From Moment to Movement". Valorie Aquino is a national board member of the March for Science movement, was a national co-chair organizing the

April 11th, 2018 NMSR Meeting: Susan Gerbic, on "Guerrilla Skepticism on Wikipedia (GSoW): It's About Time"

7:00 PM April 11th, 2018, on CNM Main Campus, STUDENT RESOURCE CENTER (SRC), room 204.



May 9th, 2018: Dave Straub on "Building Models of Historic Structures"

New Mexicans for Science & Reason (NMSR)

NMSR is a non-profit group with the goals of promoting science, the scientific method, rational thinking, and critical examination of dubious or extraordinary claims. NMSR meets at 7 PM on the second Wednesday of each month, in Albuquerque, New Mexico, at CNM's Student Resource Center, room 204 (@ Richard Barr Boardroom). NMSR Reports is its official newsletter.

NMSR officers:

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Harry Murphy, Physicist, Medical Quackery

Membership: \$20/year, includes newsletter, make your check payable to NMSR, send to treasurer (Thomas).

Newsletter available in hard-copy and downloadable PDF.

NMSR Advisors:

- **Mark Boslough**,
Physicist (Impacts, Climate Change,
Global Warming). Sandia National Labs.
- **Kendrick Frazier**
Editor, Skeptical Inquirer
- **John Geissman**
Professor of Paleomagnetism, UNM
- **Alan Hale**
Southwest Institute for Space Research
- **Randy Thornhill**
Professor of Biology, UNM

Cyber-Cypher Clue: V = C, X = W.

Bonus Puzzle Clue: Pick the right box at the start!!

WANTED: READER ARTICLES & COMMENTARY

Got something to share with NMSR members? Send it in! ATTN: Dave Thomas, Editor, NMSR Reports.

REMEMBER, our next NMSR meeting is at 7 PM on **WEDS., FEBRUARY 21st, 2018**, at Student Resource Center, room 204 at CNM!

PUZZLE TIME!

[Please send solutions to Dave Thomas at: nmsrdave@swcp.com, or at 801 Fitch Ave., Socorro NM 87801.]

Cyber-Cypher: FEBRUARY PUZZLE

(Submitted by Dave Thomas)

The following letters are a simple substitution cypher. If R stands for L, R will stand for L everywhere. Your Cyber-Cypher Clue: Clue? Oh, well - if you must, see p. 2.

" H K F E C H D C H N C A G C W F K
M G A G Z B G J , C F C W K H N O
F K M G L H J G B W F K K J . H K X
C W F E G F C Y G F K
L H J G B W F Z H J Y K B G , W K
F E Z F X G Y Z O A G Z B
N G W W . " - Y Z B C G V L B C G

SUPER SECRET WORD!

However you prefer to do the cypher itself (above or below), simply duplicate those actions on the alphabetized row of cypher letters below. You'll build an answer key, and you'll also reveal - the Super Secret Word!

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

JANUARY CYPHER SOLUTION

"THE ADMINISTRATION... [SAYS] THIS IS ONLY ABOUT WHAT GOES INTO THE BUDGET. BUT ... THE SIGNAL TO THE AGENCY IS MUCH STRONGER THAN THAT." - DR. ASHISH JHA, ON CDC'S "SEVEN WORDS" BAN

Esteemed January Code Crackers: Mike Arms*, George Egert*, Austin Moede* and Terry Lauritsen*.

*Secret Word: "SUCH LOW ABRIDGMENT"

SOCORRO STUMPER

Need more Secret Word Cryptograms?

New puzzles every week at

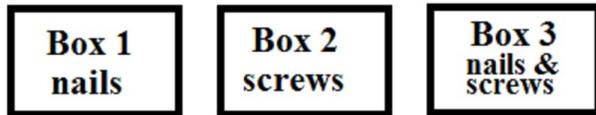
www.nmsr.org/SocorroStumper.htm

February Bonus: “Honest Advertising”

Submitted by Dave Thomas

Three boxes are all labeled incorrectly, and you must get the labels right.

The labels on the boxes read as follows:

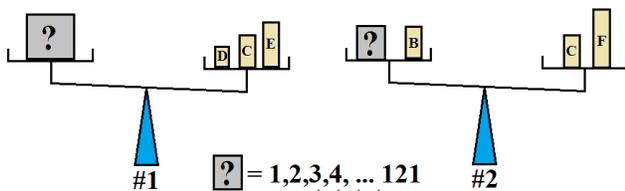


To gain the information you need to move the labels to the correct boxes, you may remove a single item from one of the boxes. You may not look into the boxes, nor pick them up and shake them, etc.

The February Bonus: What is the algorithm for success?

The January Bonus: “Inner Balance”

Inspired by David Morin, Harvard



You have a balance, and need to be able to verify any weight from 1 through 121 grams, to the nearest gram. You have a given number of unique fixed weights (called A, B, C, D, ... for convenience). You need to be able to weigh unknowns for two different modes of using your balance: Mode #1, in which only the unknown weight is on one scale, and Mode #2, in which some of the fixed weights can also be on the same scale as the unknown.

The January Bonus: What is the minimum number of weights, and what are their values, for Mode #1? For Mode #2?

ANSWER: Mode 1, 7 weights: 1, 2, 4, 8, 16, 32, and 64. Mode 2, 5 weights: 1,3,9,27,81.

Congrats: Earl Dombroski (NM), Paul Braterman (UK), Rocky S. Stone (NM)!

January 10th, 2018 NMSR Meeting: Mark Fraser, on "The Cosmic Distance Ladder - How do we really know the distance?"



At our January 10th meeting, Mark Fraser discussed how we know how big the Universe is. Mark earned a Master's Degree in Physics from the University of Missouri- Rolla, and a Bachelor of Science Degree in Engineering Physics/Mathematics from Southeast Missouri State University. He has over 30 years of experience in ballistic missile defense research, specializing in infrared signatures and image analysis, and currently teaches Astronomy at CNM.

Mark explained how Eratosthenes derived the size of the Earth by using shadows in two locations on the equinox (240 BC). Tycho Brahe's careful observations of planetary orbits allowed Johannes Kepler to find those orbits were elliptical. Newton developed calculus and gravity theory to explain why. However, we did not know the actual size of the solar system until we used parallax to measure transits of Venus in front of the sun. Those experiments, suggested by Edmund Halley, produced the first accurate measurements of the Astronomical Unit (AU, the average Earth-to-Sun distance) in the 1600s and 1700s.

As the Earth orbits the Sun, closer stars appear to move slightly when compared to distant stars. This parallax effect can be used to measure how far stars are from Earth, up to a distance of 100 parsecs (a parsec is the distance to an object with a parallax of one arc-second, and is about 200,000 AU, or 3.26 Light Years).

The absorption and emission of light due to interaction with atoms allows us to deduce the chemical compositions of stars, and Blackbody Curves permit us to deduce their temperatures. Stars have been classified in several spectral types, and identification of the type yields the absolute magnitude (brightness). By measuring the apparent magnitude of the star, we can infer its distance. For example, the Pleiades cluster is some 410 Light Years from Earth. The Hertzsprung-Russell diagram, which

plots stellar luminosity against surface temperature, provides a method to visualize the life histories of stars. Cepheid Variable stars (which pulsate over time) have been found to have a simple relationship of pulsation period to absolute brightness, which allows us to measure the distance to stars as far as 25 Megaparsecs away. Because the rotation rate of galaxies is related strongly to their luminosity, we can infer the distance to galaxies as far as 200 Megaparsecs away. Because the brightness of Type I supernovae is fairly constant, these "Standard Candles" provide distance determinations out to a billion parsecs. Doppler redshifts of distant receding galaxies, due to cosmic expansion, allow us to find distances to galaxies above a hundred million parsecs.

Mark's entire presentation, with lots of links, is posted on the NMSR website, at http://www.nmsr.org/FRASER_NMSR_Cosmic_Ladder_V2.pdf

NMSR thanks Mark Fraser for a stellar presentation.

Winter Skeptiverse Haiku! by Keith Thomas, February 2018

How long will it be Before someone claims to see Charles Manson's ghost?	Yes, it's possible! One could be both a birther And a flat- earther.
At the Winter Games, Let skin cup treatment markings Remain under wraps!	Parents, must your sons And daughters/Drink those silly Alkaline waters?
Does President Trump Seem unprecedentedly Unpresidential?	Stellar tsunami! Time-space ripples strike our shores... Can we catch some waves?

Letters to the Editor: Cosmic Expansion?

Can someone explain to me the concept of an expanding universe? Does this mean that it is constantly

receiving new matter and/or energy from somewhere? If so, where? Does it mean that the diameter of the cosmos is getting larger, but the content remains the same, meaning that the density and viscosity of the cosmos is constantly diminishing? Are the material components of the cosmos feeling this expansion, such as the galaxies getting larger diameters themselves, or do they remain the same but just keep getting farther from each other? If so, are galactic collisions now impossible? Anyway, I get more confused the more I think about it. If this expansion has been going on since the BANG, how could there have been any kind of galactic collisions?

Clarke Metcalf, feral philosopher

FLAT EARTH ARTICLES ON NMSR.ORG!

- Flat Earth Claim that Sun Acts Like a "Spotlight" -- DISPROVED!
- Simple, Inexpensive Experiment Proves Earth is Round!
- On the Flat Earth, The Sun Never Sets!
- **NEW!** On the Flat Earth, How High is the Sun?
www.nmsr.org/flatter.htm, also flatter2.htm, flatter3.htm, and flatter4.htm.

DUES - check the date on your mailing label. If it's time for you to renew, or to make a contribution, please send a check to **DEBBIE THOMAS, NMSR Treasurer**, 3205 Alcazar NE, Albuquerque, NM 87110
Name _____
Address _____
Membership \$20 per annum*
*On the Net? Ask for the Paperless NMSR Reports! Send an email to nmsrdave@swcp.com "Dave Thomas" *For Renewals that are above the \$20 annual amount, the excess will be applied to the NMSR budget. Thanks!*

The NMSR e-mail list is fun! It's an e-mail list with news announcements of interest to NMSR members, discussions about news of the times, and more. To join, send a request to nmsrdave@swcp.com.

Thanks to: John Covan, Eddy Jacobs, Debbie Thomas, Keith Thomas, and all our Puzzlers!

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FEB MEETING
March for Science
Valorie Aquino
Weds. Feb 21
7:00 PM
CNM SRC 204

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