SSIE500 Homework 3

Grant T. Aguinaldo

September 24, 2020

1 Introduction

As part of this project, we completed a series of five computations using the Mathematica Computing package. For this project, we utilized Version `12.1.1.0`. The computations for this project was done using the Desktop version of `Mathematica`. Once all of the computations were completed, we proceeded to convert the notebook into a PDF. We have included a copy of the PDF to this report as an appendix. This document was written in LaTeX using Overleaf and the appendix was attached to this document using the `pdfpages` package. An overview of the project requirements is provided in the table below.

Table 1: Summary of Requirements

	Specification Section	Report Section
Solve system of equations	1	App. Cell 1
Integrate function	2	App. Cell 2
Plot 3D surface	3	App. Cell 3
Download text and generate word cloud	4	App. Cells 4, 5
Plot trajectory using natural language mode	5	App. Cell 6
Produce LaTeX report using `pdfpages`.	All	1

2 Results

This project used the `Mathematica` computing package to complete five computations. The solutions to the problem set is provided as an Appendix to this document. While this is not noted in the PDF file, Question 3 was completed using the `Manipulate`[1] function in `Mathematica` and in the Desktop version of this notebook, the user is able to freely vary the parameters a and b to change

---

[1] https://reference.wolfram.com/language/ref/Manipulate.html

the surface. Finally, we like to note that to get the notebook to accept commands using the natural language input, we needed to start the command with the following command, "==" as noted in the documentation.[2]

Appendix

In[1]:= (*Homework 3 Problem 1.*)
Solve[{((x^2) + (y^2) + (z^2)),
    ((x) + (y) - (3 z)), ((x^2) - (2 x) + (y) - (z^2))} == {1, 0, 0}] // N

Out[1]= {{x → 2.16667 - 0.5 i, y → 0.333333 + 2. i, z → 0.833333 + 0.5 i},
    {x → 2.16667 + 0.5 i, y → 0.333333 - 2. i, z → 0.833333 - 0.5 i},
    {x → -0.408248, y → -0.816497, z → -0.408248}, {x → 0.408248, y → 0.816497, z → 0.408248}}

In[2]:= (*Homework 3 Problem 2.*)
Integrate[((x^2) * Cos[2 x]) + ((e^x) / (1 + Tan[x])), x]

Out[2]= $\frac{1}{4}$ ((2 + 2 i) e^x + 2 x Cos[2 x] -

    4 i e^x Hypergeometric2F1[- $\frac{i}{2}$, 1, 1 - $\frac{i}{2}$, i Cos[2 x] - Sin[2 x]] - Sin[2 x] + 2 x^2 Sin[2 x])

In[3]:= (*Homework 3 Problem 3.*)
Manipulate[
 Plot3D[Sin[x^ (a + b)] * y^ (a - b),
   {x, 0, 2 π},
   {y, 0, 2 π}, PlotStyle → Opacity[0.45]
 ], {{a, 2}, 0, 2, 0.0025, Appearance → "Labeled"},
 {{b, 2}, 0, 2, 0.0025, Appearance → "Labeled"},
 FrameMargins → 0
]

Out[3]=
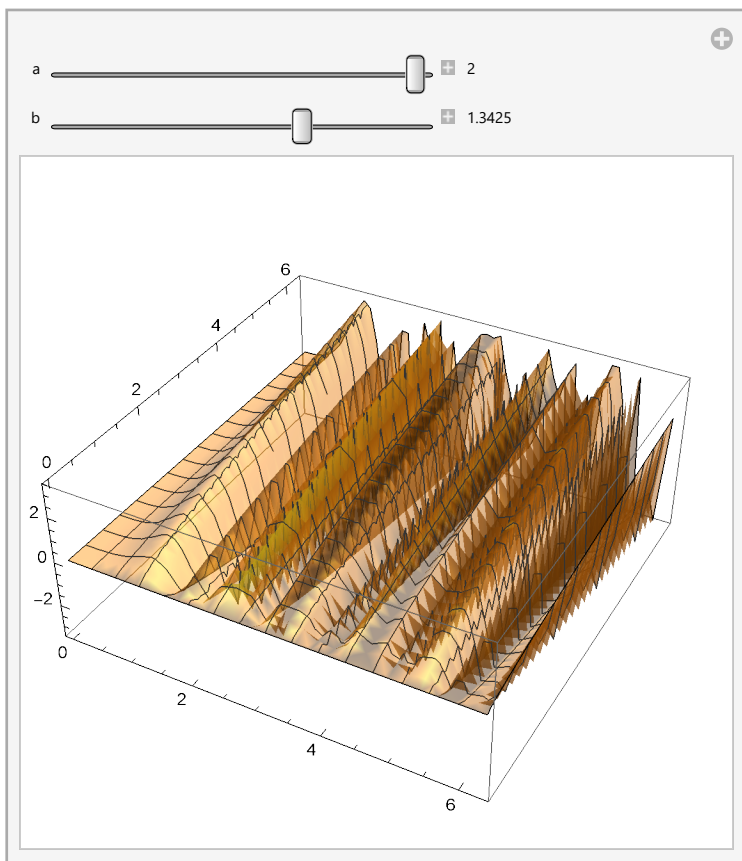
(*Homework 3 Problem 4.*)

In[4]:= **data = Import["https://www.enveraconsulting.com/scaqmd-air-permit-denials/"]**
WordCloud[data]

Out[4]= Skip to primary navigation Skip to footer
navigation Skip to content Skip to primary sidebar Skip to footer

Check out our best resources to get an AQMD permit

Envera Consulting
California Air Quality Compliance

Search site Search

Home About Articles
Air Permits Annual Emission Reports SCAQMD Basics SCAQMD Rules
Environmental Compliance EPA Regulations Envera News Services Resources
Annual Emission Report (AER) Resources What Is the South Coast Air Quality
Management District (SCAQMD)? SCAQMD Air Quality Permitting Resources A Short
Guide to the SCAQMD's RECLAIM Program Web Resources Air Rules App Contact

You are here: Home / SCAQMD Basics / What Happens If the SCAQMD
Denies Your Air Permit What Happens If the SCAQMD Denies Your Air Permit
December 7, 2018 By Grant T. Aguinaldo

(Credit: Pugo Design Studio)
For any project, the issuance of a permit from the SCAQMD is a major milestone.
Once the permit is issued, equipment deliveries can be set, contractors
can be hired, and — most importantly — work on the project can start.
While I like to take a glass-half-full approach to life, the reality is that permit
denials do happen. But that doesn't mean that's the end of the story. Even
after a denial, you still have options. Common Reasons for Permit Denials
While there are multiple reasons why a permit might be denied,
the most common is when the equipment cannot be expected to
comply with all the applicable regulations. Pretty obvious.
Another reason, found in Rule 210, is that the SCAQMD can deny a permit if the
applicant has not provided all the required information to deem the application
complete within 120 days of filing. Once you submit your permit application,
the SCAQMD engineer reviews the material and determines if the application can
be deemed complete so that the engineer can start processing the application.
In the case that your application cannot be deemed complete, the SCAQMD will
reach out to you with an additional information (AI) request. If you receive
an AI, always reply to the permit engineer as soon as possible, even if that
means just letting them know when they can expect the requested information.
If you're slow in getting back to them, Rule 210 allows the SCAQMD to
flat-out deny your permit if you are not responsive. So don't dilly-dally!
On a side note, the SCAQMD can also deny your permit under Rule 210
for reasons that pertain to the California Environmental Quality

Act (CEQA) process, although that's a topic for another article.

If you're a Title V facility , there's the additional possibility that can be a factor in whether a permit gets issued or denied: Either the EPA or the public can take issue and provide comments that could lead to the denial of your permit application. When this happens, it usually means either that one of these two parties has developed a concern that the proposed equipment cannot comply with the current rules or that the regulatory agency has failed to consider a specific rule(s) for the proposed equipment during the permitting process.   The Denial Cometh

If the SCAQMD denies your permit, Rules 210 and 214 require that the agency notify you within 30 days why your application is being denied. In addition, once the denial is issued, Rule 214 states that another application for the piece of equipment cannot be submitted unless the applicant has resolved the reasons for the denial of the permit.

However, Rule 215 states that you can assume your permit has been denied if the SCAQMD has "[failed] to either approve or deny the application for a permit to construct within the time period specified by Rule 210(d)." In other words, you can assume that your permit is denied if you do not hear from them within the 120-day timeline noted in Rule 210. However, the SCAQMD is pretty good about reaching out to you within the 30-day window. If you haven't received a notification, check with your permit engineer.   Appealing the Denial

Got denied? All hope is not lost. You can still file an appeal with the SCAQMD's Hearing Board.

Per Rule 216, you have 30 days from the date of the written denial notification to file an appeal. File the appeal with the Clerk of the Board, using the specific SCAQMD Hearing Board form . The filing must include the completed original (printed, single-sided) as well as eight copies of the form (which can be printed double-sided). The written appeal must be submitted along with the required filing fee noted in Rule 303, Table III (currently $282.34 if you're a small business and $1,889.19 if you're not, based on the May 4, 2018 version of the rule).

Unless the Hearing Board determines another timeline, the hearing should start within 30 days of the Board receiving your appeal application. At the hearing, you will have an opportunity to present your evidence, documentation, and witnesses. The Board then decides to either uphold or reverse the SCAQMD's initial decision.

While the SCAQMD does have a mechanism to appeal a denied permit, in our experience, it's quite rare to need to go down this road, as the SCAQMD's permit engineers really work with you to be sure that your equipment can be permitted. Obviously, this assumes that you are either aware of all of the SCAQMD's requirements or have hired a consultant to guide you in the process.

   Related

Filed Under: SCAQMD Basics Tagged With: Rule 210 , Rule 214 , Rule 215 , Rule 216

 Want More Environmental Compliance Tips?

Ensure you stay in compliance by getting news and updates delivered right to your inbox. Sign up for the Envera newsletter.

Sign Up   About Grant T. Aguinaldo

Grant is a principal at Envera Consulting. As the Sherlock Holmes of environmental consulting, Grant solves current-day problems using modern tools. More on Twitter or LinkedIn .   Primary Sidebar

Sign Up for Our Newsletter
Get weekly tips and news on California's air quality regulations
   right in your inbox.   First Name   Enter your email address...
   Recent Articles
   What Happens If the SCAQMD Denies Your Air Permit   December 7, 2018   A
   4-Tiered Analytics Maturity Model for Environmental Compliance   November
   16, 2018   Parking Tickets, Environmental Noncompliance & the SCAQMD's
   Variance Process   October 5, 2018   Why Emissions Guarantees Are So
   Crucial for Permit Applications   September 21, 2018   The Compliance
   Trifecta: Monitoring, Recordkeeping, and Reporting   September 7, 2018
Footer

Contact Information
Envera Consulting
 1107 Fair Oaks Avenue ♯295
 South Pasadena, CA 91030
 grant.aguinaldo@enveraconsulting.com
 415-203-0520

Let's Get Started on Your Project!
Let Envera Consulting help you navigate your business to compliance.
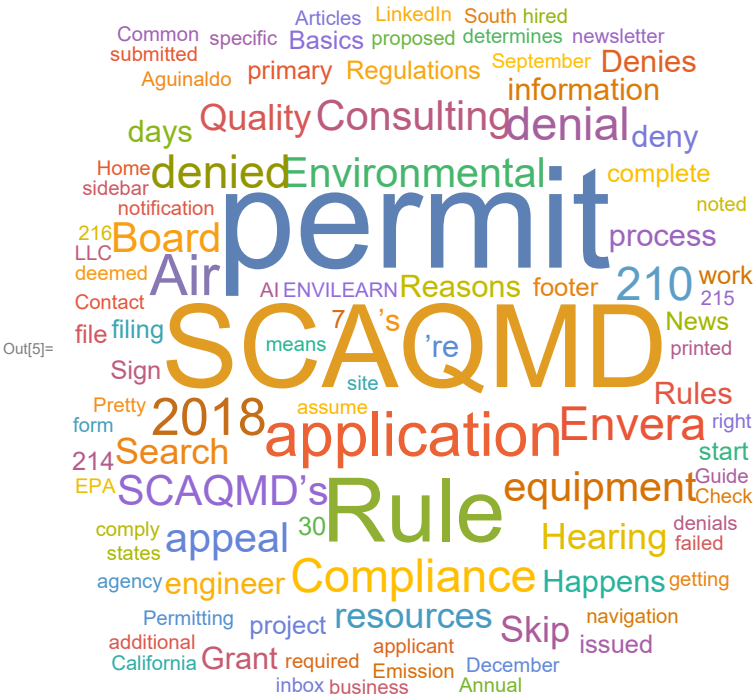 Work With Us

Search   Search site Search

LinkedIn Instagram Facebook Twitter

Copyright © 2014 - 2018 ENVILEARN, LLC DBA ENVERA CONSULTING
   ENVERABYTE IS A REGISTERED TRADEMARK OF ENVILEARN, LLC · Log in
Privacy Policy · Terms of Service

Out[5]=

permit SCAQMD Rule Environmental application Consulting denied Quality Air Board 2018 Envera Compliance Rules Search appeal Reasons equipment Hearing resources Skip denial deny Grant Happens Happens

(word cloud containing the following terms:)

Articles LinkedIn South hired
Common specific Basics proposed determines newsletter
submitted September Denies
Aguinaldo primary Regulations information
days Quality Consulting denial deny
Home denied Environmental complete
sidebar
notification noted
216 Board process
LLC permit
deemed Air 210 work
Contact AI ENVILEARN Reasons footer 215
file filing News
means 're printed
Sign SCAQMD Rules
site
Pretty assume right
form 2018 application Envera start
214 Search Guide
EPA SCAQMD's Rule equipment Check
comply appeal 30 Hearing denials
states failed
agency engineer Compliance Happens getting
Permitting project resources Skip navigation
additional applicant issued
California Grant required Emission December
inbox business Annual

In[ ]:= **(*Homework 3 Problem 5.*)**

In[6]:= **☀ trajectory of the New Horizons space probe**

> ⇨ Using closest Wolfram|Alpha interpretation: **New Horizons space probe** ❓
>
> More interpretations: trajectory

Assuming the input is a deep space probe | Use "New Horizons" as a child care provider instead

Input interpretation: ⊕

New Horizons (deep space probe)

Probe properties: Show metric   More   ⊕

targets	Jupiter | Pluto | 486958 Arrokoth (2014 MU69)
dry mass	849 lb
launch mass	1030 lb
length	6.9 ft
width	8.9 ft
height	7.2 ft
heliocentric velocity	31 200 mph

orbital inclination	2.2°
power source	radioisotope thermoelectric generator
distance from Sun	4.5 billion mi 48.4 au
distance from Earth	4.47 billion mi 48.1 au

Mission properties: More ⊕

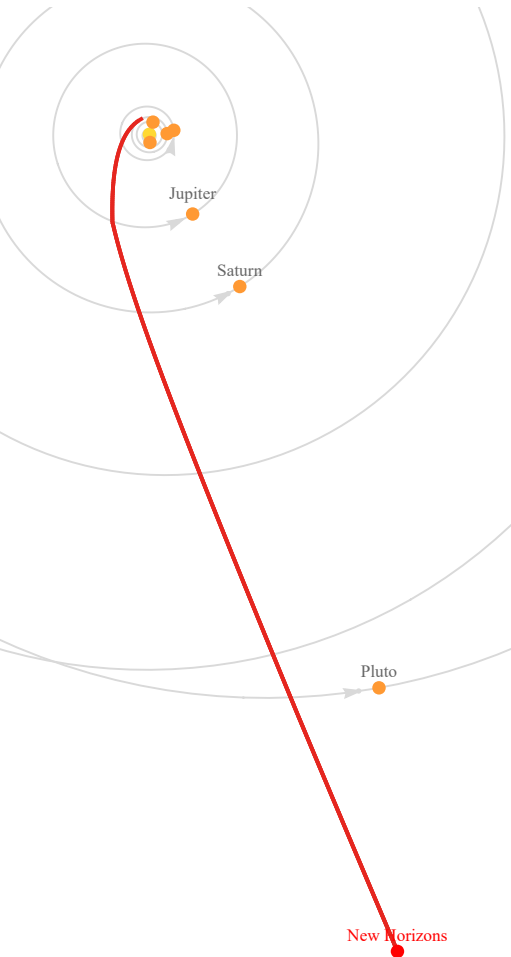|		
launch date	Thursday, January 19, 2006 (14 years ago)	
arrival dates	Jupiter	9:43:40 pm PST	Tuesday, February 27, 2007
	Pluto	4:49:57 am PDT	Tuesday, July 14, 2015
	486958 Arrokoth (2014 MU69)	9:33:00 pm PST | Monday, December 31, 2018

Current probe position: Hide arrows ⊕

Jupiter

Saturn

Pluto

New Horizons

Image:

Equatorial location: Show decimal

| right ascension | 19 ^{h} 7 ^{m} 17 ^{s} |
| declination | −20° 33' |

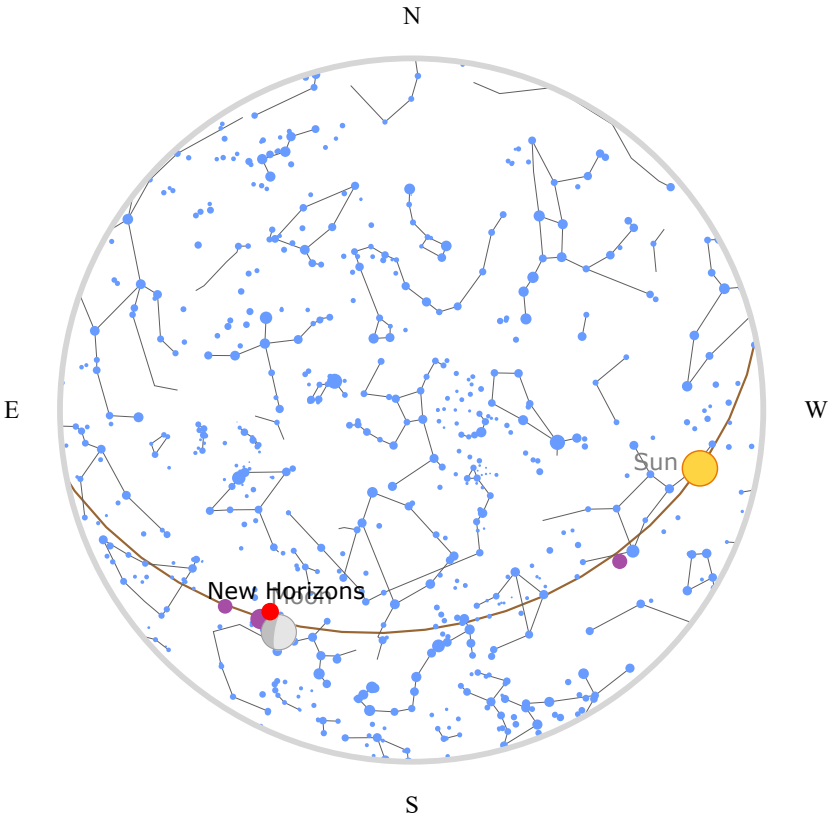✚ Units

Current sky position from Los Angeles, California: Show mesh   Zoom   Show decimal

| altitude | 26° 58' (◿) |
| azimuth | 144° 56' (SE) |
| constellation | Sagittarius |

Wikipedia summary:

More ⊕

New Horizons is an interplanetary space probe that was launched as a part of NASA's New Frontiers program. Engineered by the Johns Hopkins University Applied Physics Laboratory (APL) and the Southwest Research Institute (SwRI), with a team led by S. Alan Stern, the spacecraft was launched in 2006 with the primary mission to perform a flyby study of the Pluto …

Wikipedia page hits history:

Log scale ⊕
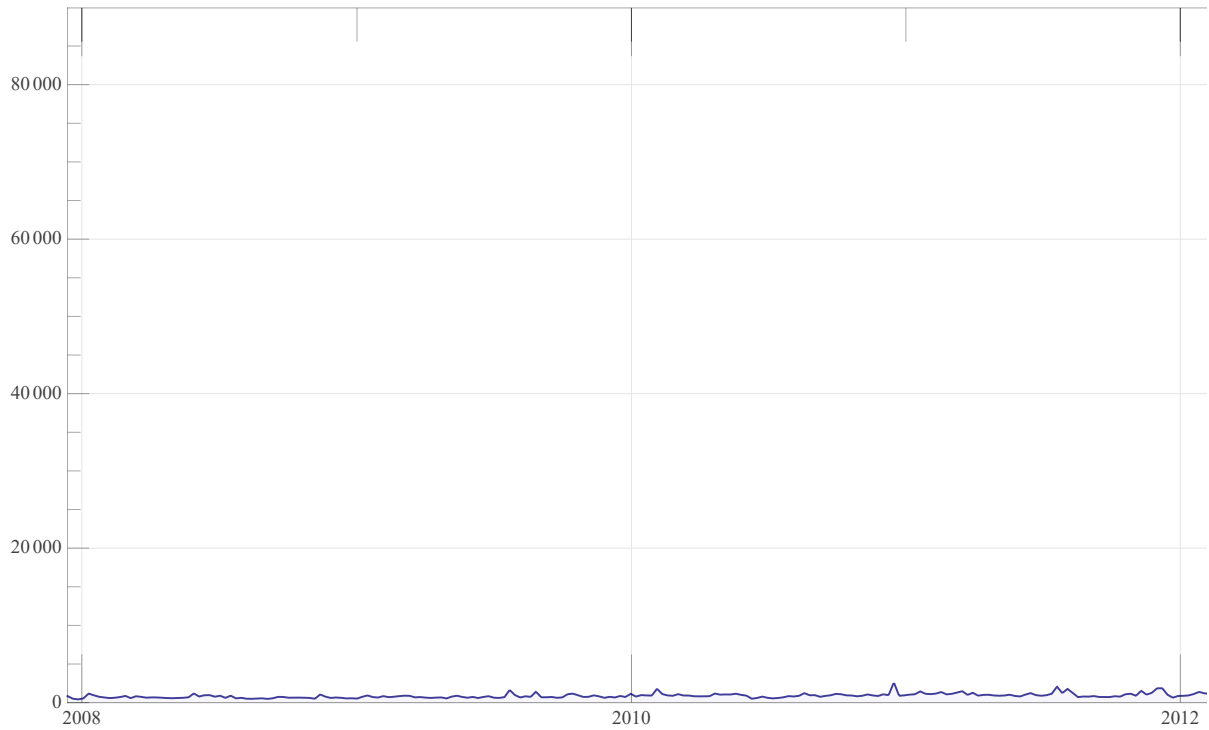
(in hits per day)

(based on weekly averages of daily hits to English-language "New Horizons" page)

WolframAlpha ⊕