Energy A.I. 2026
6th Annual Hackathon
Introduction

Dr. Michael Pyrcz and Dr. John Foster
Energy A.I. 2021-2026 Hackathon Hosts
Hildebrand Department of Petroleum and Geosystems Engineering

Dr. Matt Balhoff
Sponsor and Advisor
Chair of the Hildebrand Department of Petroleum and Geosystems Engineering

Dinghan Wang and Nataly Buitrago-Chacon
Hackathon Architects and Mentors, Graduate students in PGE

Rowan Halliday, Gabby Banales, Jaime Haider and Stacia Miller
Coordinators of Chaos

Appreciation

Appreciation to the student participants, the hackers!

Thank you for your enthusiasm!

None of this would be possible without our sponsors. Thank you for supporting Energy Data Science Education!

Thank You to Our Sponsors

Platinum

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PHILLIPS 66

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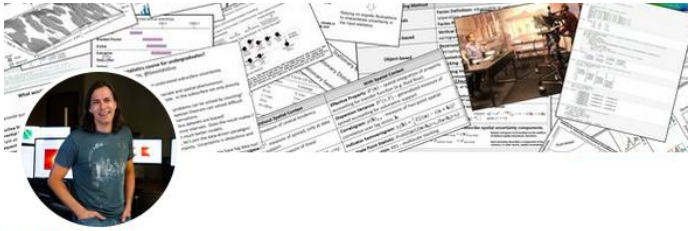
Bronze

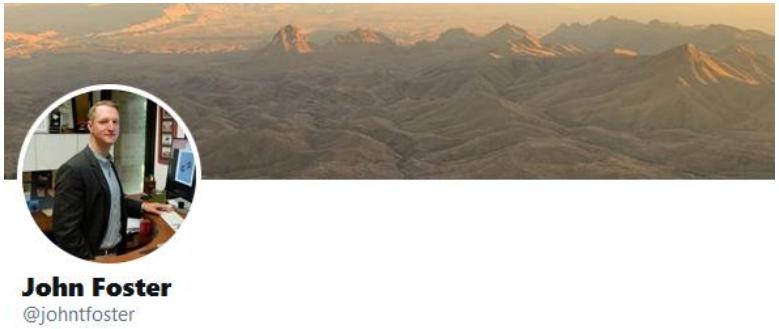
ELK RANGE ROYALTIES

ComboCurve

Who's Running this Show?

Professor Michael Pyrcz (aka GeostatsGuy)
Hackathon Host





Professor John T. Foster
Hackathon Host

Dr. Nataly Chacon-Buitrago, UT PGE
(PhD complete Nov. 2025), soon BP
Hackathon Architect

Dinghan Wang, PhD Candidate PGE
Hackathon Architect

Appreciation

Rowan Halliday
Coordination

Professor Matt Balhoff
PGE Chair
Strong support and engagement

Stacia Miller
Communication, Promotion, Photography

Jaime Haider
Organizing, Student Engagement

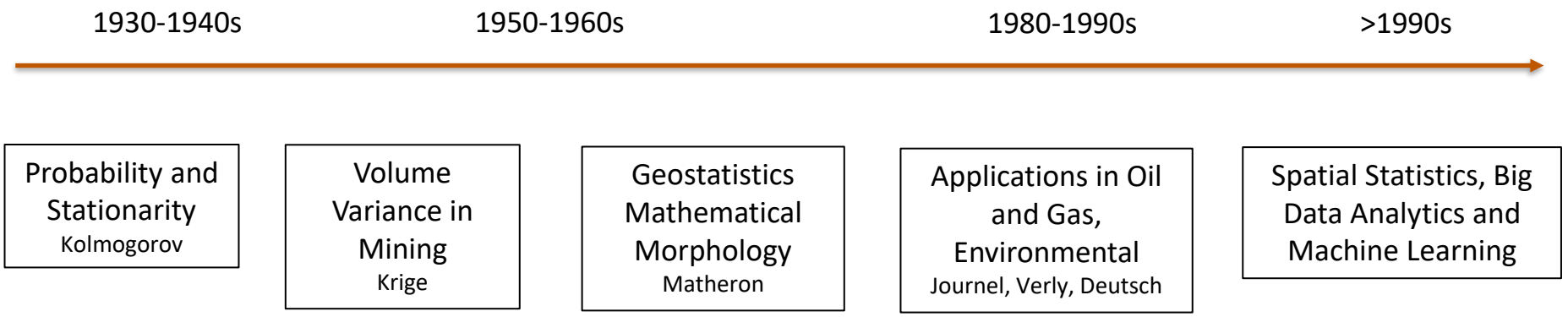
Gabby Banales
Organizing, Student Engagement

Welcome Message

Professor Matt Balhoff
Chair of the Hildebrand Department of Petroleum and Geosystems Engineering

Petroleum / Mining / Spatial Engineering and Science Leadership in the Fourth Paradigm

'We are the original data-driven science, we have been big data long before tech learned about big data!'



'Complicated, heterogeneous, sparsely sampled, vast systems with complicated physics and high value decisions.'

What is a Hackathon?

'an event in which a large number of people meet to engage in collaborative computer programming.'

Dictionary.com

'The goal of a hackathon is to create functioning software or hardware by the end of the event'

Wikipedia

The University of Texas at Austin
Hildebrand Department of Petroleum and Geosystems Engineering
Cockrell School of Engineering

Energy A.I. Hackathon

Hosted by PGE's Resident A.I. Experts
Dr. John Foster and **Dr. Michael Pyrcz**
@johntfoster @GeostatsGuy

Mentors

Eduardo Maldonado-Cruz
Jose Salazar
Fabian Laugier
Sarah McDonnell
Guillaume du Lac
Jaimie Vargas

Tyrel Krohn
Vrishank Jannu

Mide Mabadeje
Lei Liu

Vikram Jayaram

Eric Qian

Wen Pan

Travis Salomaki

Sercan Gul

Hyeok Kong

Marcelo Jimenez
Misael Morales
Hector Martinez
Varun Gupta

Charles (Cheolkyun) Jeong

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Judges

Dimitrios Belvanis
Data Engineer

Philip T Mantaring
HR Advisor, Academic and Technical Programs

Jaimie Vargas
Russel Zhao

Andy Flowers
Manager, Enterprise AI

Hector Martinez
Data Analytics Supervisor

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Who is Here to Build? Longhorns from all over the 40 acres!

Teams, from UT Austin Engineering, Geosciences, Natural Sciences, Business, Liberal Arts, Communications, etc.

Teams present include:

Bevo Buddies
Boolean Bandits
Brian Oil
ChatPGE
Data Daricks
Hack the Rock
Kerosene
Ohm Sweet Ohm
Canes Crew
Sherlock Ohms
CHAIN
FussionX
qwerty
Team 1
Watt the Frack
Hook'em Hacks

The Hackathon Rules

Submit to GitHub by 12:00 noon, February 1st:

❑ **Well-documented Python workflow in a Jupyter Notebook. See template in resources folder.**	**[Team_Name].ipynb**
❑ **Short presentation with executive summary, goals, workflow choices and defense, results and discussion. See template in root.**	**[Team_Name].pptx**
❑ **Populate solution in this DataFrame saved as a .csv file. See template in root.**	**solution.csv**

Complete 10:00 am, February 1st :

❑ **Team confirmation form, with team name, and members**

Participation: All team members contribute to the above products and participate in the presentation. There are various roles!

Coding: Use only open source and methods / workflows developed during the hackathon. Provide code for testing and scoring. All code submitted in Jupyter Notebook. **Readable code!**

The Hackathon Rules

Our academic staff have volunteered to assist over the weekend.

- **Please let them know that we appreciate. Please treat them with great respect.**
- **Let's all do house keeping, clean up and disposal of recycling and waste in your work area and general areas, as we go. Take out the trash. Offer to help the staff!**
- **Share contacts within your team in case you get locked out. PGE student can open external door if locked.**

The Hackathon Rules

Participate in the Scheduled Workshops and Working Sessions

Treat All other Hackers, Hosts, Mentors, Judges, Coordinators with the respect.

Use code from others, but cite all code used from other sources in your workflows and presentations, e.g., figure captions.

Pyrcz, M.J. (2020) GeostatsPy 0.0.19 [Source code]. https://github.com/GeostatsGuy/GeostatsPy
Foster, J.T., (2015) 1DPDpy 1.0 [source code]. http://dx.doi.org/10.5281/zenodo.15795

Work Hard, Learn and Have Fun, Longhorns!

The Hackathon Rules

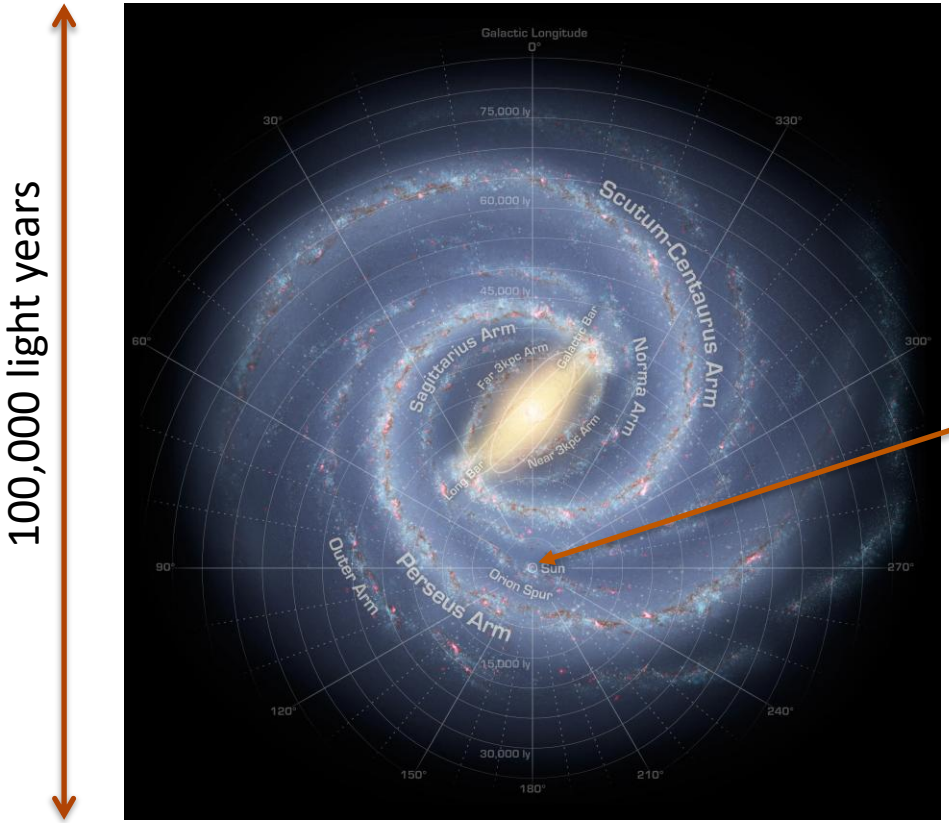
The data has been sanitized. Do not attempt to hack the source!

But here's a hint…

The Hackathon Rules

The data has been sanitized. Do not attempt to hack the source!

We can provide the following general location of the data set.



Our Galaxy

Hackathon Team Scoring

Results: 75% - Results, Results, Results!

- Average of rank transform of accuracy error measure and uncertainty model goodness over all groups.

Presentation: 20% - and We Must Be Able to Communicate Our Work!

- Executive summary, project goals, workflow description, results and discussion, **novel data analytics, and data and model viz**, finish on time

Workflow: 5% - Others Must Understand our Work for Adoption!

- Scoring metrics: readable code, efficient code, documentation of steps

Use the provided templates for results, workflow and presentation. Follow the submission guidelines and submit on time.

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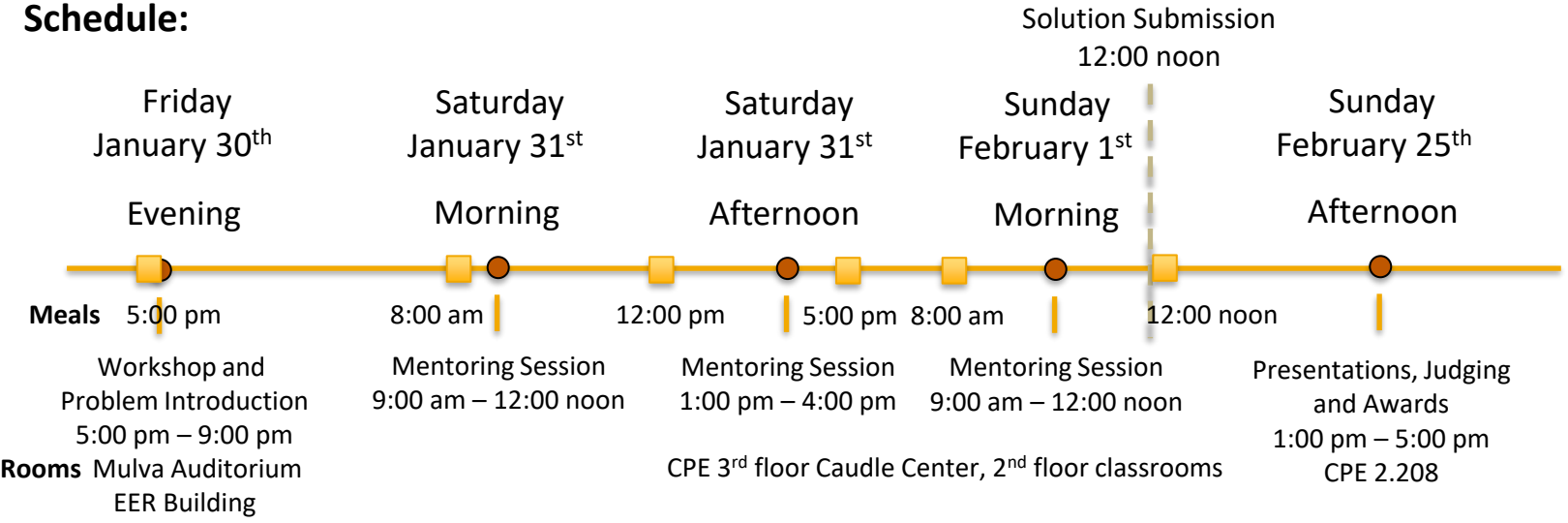
The Plan at 30,000 ft

Apply Data-driven Solutions with Data Analytics and Machine Learning

Schedule:



Enhance Learning

Promote collaboration & data-driven science

Inspire Innovation

Teams:

Register teams of 3-5, which can include students from other departments and schools (Current UT student, EID required), but one student must be a UT PGE student and one 1 undergraduate student per team (could be the same student).

Awards:

Winners of the A.I. Hackathon will be awarded bragging rights and $5,000 for first place, $2,500 for second place, $1,000 for third place and $500 for fourth place teams.

The Plan for Today's Workshop

DAY 1 / Jan. 23rd - Energy A.I. Hackathon 2026 Workshop Schedule

5 pm – 5:15 pm: **Hackathon Welcome**, Introduction and Review Plan and Rules, Prof. Balhoff / Prof. Pyrcz

5:15-6:30 pm: **Essential Energy Data Science**, Numpy, Pandas, Git - Prof. Foster

6:30 – 7:00 pm: **Feature Engineering**, Feature Importance, Engineering and Selection, and Shapley Values Prof. Pyrcz

7:00 – 7:30 pm: **Uncertainty Models** – Prof. Pyrcz

7:30 – 8:00 pm: **Machine Learning Basics**, Train and Tune Overview of Methods - Prof. Pyrcz

8:00 – 8:30 pm: **Machine Learning in Python**, scikit-learn and TensorFlow Packages – Prof. Foster

8:30 – 9:00 pm: **Introduce the Energy A.I. Hackathon Problem and Mystery Data Set** – Profs. Pyrcz / Foster

9:00 pm - : **Teams Break-out for Initial Data Review and Planning**

The Plan for Today's Workshop

DAY 1 / Jan. 30th - Energy A.I. Hackathon 2026 Workshop Schedule

It is a lot of work, stick with it, it will be worth it!

Hackathon Finish photo from 2024.

Hackathon Finish photo from 2025.

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Top Teams from Last Year

DATACOMRADES, First Place
Fehmi Özbayrak, Ibrahim Hassan Gomaa, Zulkuf Azizoglu, Paawan Desai, Yevgeniy Samarkin

Green Bay Frackers, Second Place
Satvik Duddukuru, Joshua Yue, Parth Gupta, Akshat Kumar, Rashed Alsuhabi

Don't Jump to Complexity

Deep learning generated image of Professor Pyrcz.

Deep learning generated image of Professor Foster.