



Research Experiences
For Undergraduates

NSF - REU Research Experiences for Undergraduates

Queensborough Community
College
Summer 2022

For Community College Students Only

Research Areas:

Physics (Acoustics, Spectroscopy)
Astronomy, Astrophysics
Biophysics

10 Week Program (May 31 – August 5)

4-5 days/week

\$6000 stipend

Travel and Lunch Stipend

Extension to the Academic year

1 day/week

\$100/day plus travel

Fully in person



Last Summer's Research Students



RECENT SUMMMER PROJECTS

What kind of Projects can you expect if you join us?

Wandering Black Holes in Dwarf Galaxies

The black hole will initially move like this



- Here are some of the quantities from our galaxy:

- Galaxy Diameter: 2 kpc

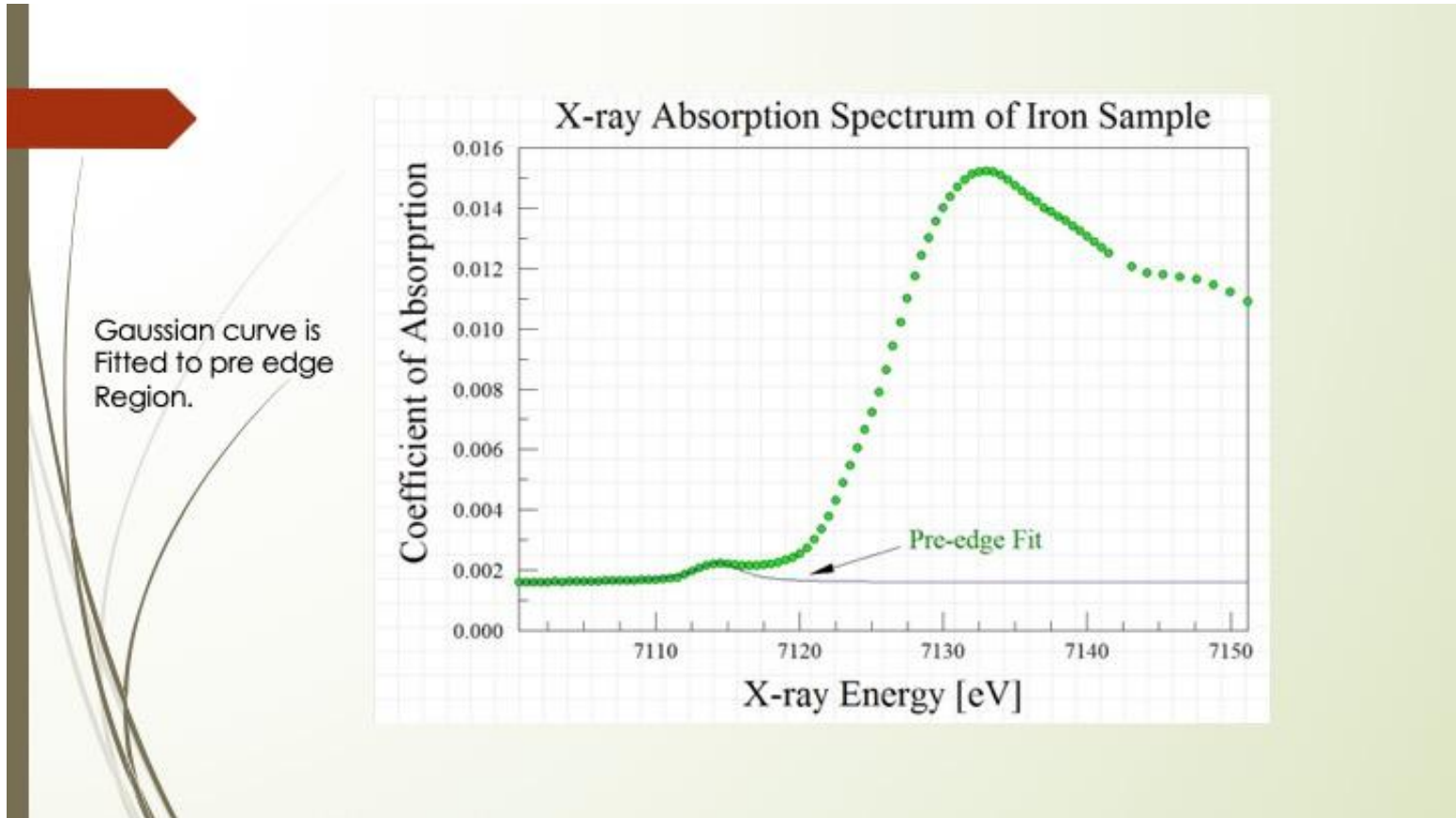
- Range of # of Stars in Sphere of Influence: 0-130

- Mass of BH: About 163,000 M_{sol}

- Total Stellar Mass: 12,000,000 M_{sol}

The BH is 1.33% of the Stellar Mass of the Galaxy

X-ray Absorption Spectroscopy



Nadia Dob / Mentor: Sunil Dehipawala

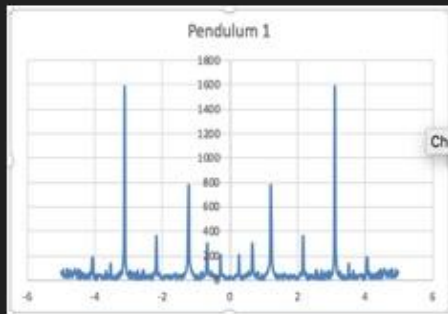
Exoplanet Transit

A Journey Through the Neptunian Desert

About the pendulum

- Shortened the Period in order to mitigate the circular motion of the pendulum

$$L = 0.259\text{m } T = 1.02\text{ s}$$

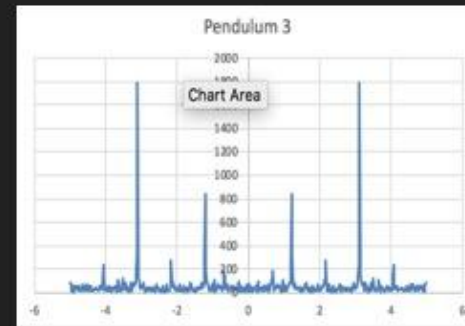


Significant points
 $f = 1.211\text{Hz} \ \& \ 3.105\text{Hz}$

$$T = 1/f$$

$$0.8257\text{s} = 1/1.211$$

$$0.3221\text{s} = 1/3.105$$



Noel Castillo / Mentors: George Tremberger, Tak Cheung

Sonic Boom Propagation



SUPERSONIC FLIGHT TODAY

- Since 1973, sonic boom noise has been banned.
- Some concerns of supersonic flight is the interaction of sonic booms with structures.
- Currently, NASA is working on the Lockheed Martin X-59 QueSST (Quiet SuperSonic Technology) as part of the Low-Boom Flight Demonstrator program.
- The aim of the technology is to lower the loudness of the sonic boom and make it as loud as a car door closing.

Cosmic Ray Detection

Array at QCC



Wrapping



Bare scintillator

White Tyvek paper

"Light tight" paper

"Light tight" PVC film

- From single wrapped to triple wrapped.
- Issues when fitting back into frame.

Nkeiru Ubadike and Austin DeMurley / Mentor: Raul Armendariz

How to Apply

QUEENSBOROUGH
COMMUNITY COLLEGE 

Requirements

- Full time student
- US Citizen or Permanent Resident

- Application – online form (FormStack)
<http://www.qcc.cuny.edu/physics/reu.html>
- Brief Essay – why you want to participate
- Letter of Recommendation
- Official Transcript

Essay and unofficial transcript can be upload with the application. Letters of Recommendation should be emailed to REU@qcc.cuny.edu or can be sent via us mail

Mail official transcripts to:
Dr. Kimberly Riegel
Queensborough Community College
Physics Dept, Science Building Rm 339
222-05 56th Ave
Oakland Gardens, NY 11364-1497

Or if your college uses electronic transcript delivery, they should be sent to;
kriegel@qcc.cuny.edu