

Minnesota QuarkNet Workshop - 2024

Monday, Aug 6, 2024 - U of M PAN Room 110

First Rule: If you understand Quantum Mechanics, then you don't understand Quantum Mechanics.

Time	Activity & Links
09:00	<u>Opening Session</u> • Coffee • Sign-in and Registration • Introductions & Updates
09:30	Introduction to Modern Classroom (Jodi Hansen) • Slides
11:00	Talk: <i>My Academic Journey</i> , Ricco Venterea • Link to slides
12:00	Lunch
13:00	Continue Modern Classroom (Jodi Hansen)
14:00	Quantum Workshop Activities • Light as a wave ◦  Water Waves - Interference Experiment ◦  Wave Interference Lab - Part 1 ◦  Interference Part 2 : Geometry • Light as a particle ◦  Photoelectric Effect Demonstration ◦ Half the group completes Robert Millikan Photoelectric Activity-stu.docx ◦ Half the group completes LED UPDATED.docx and  LED Video.mp4 ◦ Optional spreadsheet for both
16:00	End of day

Tuesday, Aug 7, 2024 - U of M PAN Room 110

Time	Activity & Links
09:00	<u>Opening Session</u> • Morning discussion • Q&A
09:15	Quantum Workshop Activities • Quantum Concepts tutorial • Neutrino videos ◦ Even Bananas 08 ◦ Even Bananas 10 ◦ Minute Physics
11:00	Talk: <i>Neutrino Oscillations and the SBN Program</i> , Nikki Pallat
12:00	Lunch
13:00	Quantum Workshop Activities • Electron Diffraction (spreadsheet) • TOTEM - proton interference and... ◦ Measure two angles for each event from data ◦ Record in form at https://forms.gle/qX3cmFHXXfAJbud36 ◦ Results in sheet
14:30	BREAK
14:45	<u>Workshop Activities</u> • Implementation discussion & plans • Teacher Survey • If a teacher completed the Full Teacher Survey anytime in 2023, then complete the UPDATE: 2024 Teacher Survey (once during 2024). https://www.surveymonkey.com/r/JNPN6BD Plan for ~6 minutes here. ◦ OR...Spanish version of Update Survey: https://www.surveymonkey.com/r/JNP67QJ • If a teacher did NOT complete the Full Teacher Survey anytime in 2023, then complete The Full Teacher Survey. https://www.surveymonkey.com/r/G8P3C8R We ask that an individual teacher complete this only once in 2024. Plan for ~15-20 minutes here.
15:45	End of day discussion

16:00	End of day Optional social event: Meet up at Surly's
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Wednesday, Aug 8, 2024 - U of M Tate Room 301-20

Time	Activity & Links
09:00	<u>Opening Session</u> • Morning discussion • Q&A
09:15	Quantum Workshop Activities • Heisenberg's laser (data) (spreadsheet) • What Heisenberg Knew • Discussion: ○ First Rule of Quantum Mechanics ○ Big ideas
11:00	Talk: <i>Dethroning the Standard Model: Neutrinos and Muons at Fermilab</i> , Ben Messerly • Link to slides
12:00	End workshop & (optional) lunch

Additional Resources:

- Rebecca Messer's article from The Physics Teacher (January, 2018): [Single Slit Interferences/hair & laser](#)
- Materials from Rebecca Messer: [Single Slit lesson materials](#)