

Boston Area QuarkNet
2021 Summer Workshop
Photons: X-rays and Gamma Rays

August 3-4, 2021
Roxbury Latin School Physics Lab

NOTE: A laptop with Excel will be useful for data analysis exercises.

Agenda Tuesday, August 3

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| 08:30 – 09:00 | Gather, greet, and <u>sign-in</u> in the Roxbury Latin Physics Lab |
| 09:00 – 09:30 | Photoelectric Effect History – Rick Dower |
| 09:30 – 10:15 | Millikan Photoelectric Data Analysis |
| 10:15 – 10:30 | BREAK |
| 10:30 – 10:45 | Comment on Perimeter Institute LED “ h ” Value Exercise and apparatus |
| 10:45 – 11:15 | X-ray Discoveries – Rick Dower |
| 11:15 – 12:00 | Numbering the Elements – Rick Dower |
| 12:00 – 13:00 | LUNCH – Bring your own or choose a West Roxbury Restaurant. |
| 13:00 – 14:00 | Henry Moseley Data Analysis |
| 14:00 – 14:45 | Chandra Presentation – Dr. Pat Slane |
| 14:45 – 15:00 | BREAK |
| 15:00 – 16:00 | X-ray DNA Analysis |
| 16:00 – 16:30 | QuarkNet housekeeping: update QuarkNet profile, as necessary. |

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Agenda Wednesday, August 4

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|---------------|---|
| 08:30 – 08:45 | Gather, greet, and <u>sign-in</u> in the Roxbury Latin Physics Lab |
| 08:45 – 09:15 | X-ray Q&A – Reflections on yesterday’s material, soft and hard x-rays. Why is argon about 1% of Earth’s atmosphere? |
| 09:15 – 09:30 | X-ray fluorescence spectrometers in industry, arts |
| 09:30 – 10:15 | X-ray Astronomy – Rick Dower |
| 10:15 – 10:30 | BREAK |
| 10:30 – 11:00 | Gamma Rays – Rick Dower |
| 11:00 – 11:30 | Gamma Ray Spectrometer demonstration |
| 11:30 – 12:00 | Relativity Review |
| 12:00 – 13:00 | LUNCH – Bring your own or choose a West Roxbury Restaurant. |
| 13:00 – 14:00 | Compton Scattering Data Analysis |
| 14:00 – 14:30 | Ba-137m → Ba-137 demonstration (half-life) |
| 14:30 – 14:45 | BREAK |
| 14:45 – 15:15 | Tc-99m → Tc-99 and Bone Scans, PeV gamma rays from Crab Nebula |
| 15:15 – 16:15 | Exercise wrap-up; Brainstorm ways to incorporate workshop material or insights into curriculum. |
| 16:15 – 16:30 | QuarkNet Teacher Survey or Teacher Survey Update |