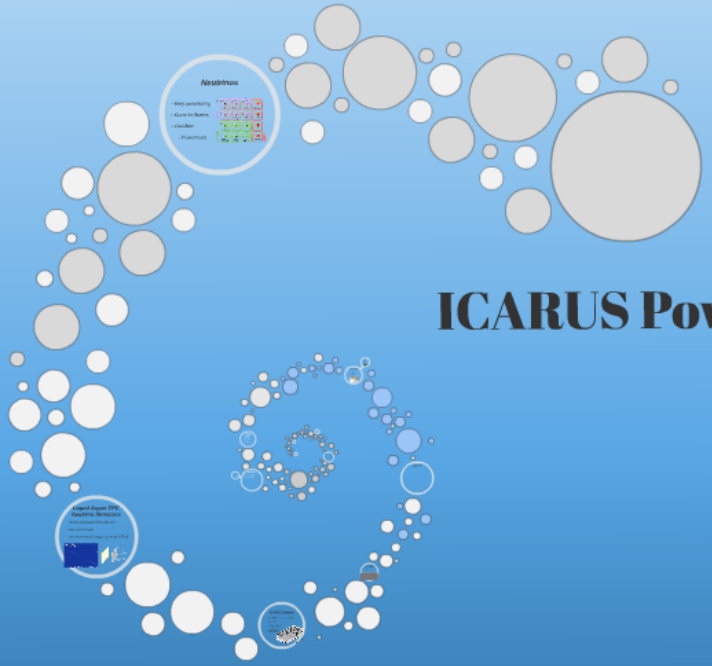
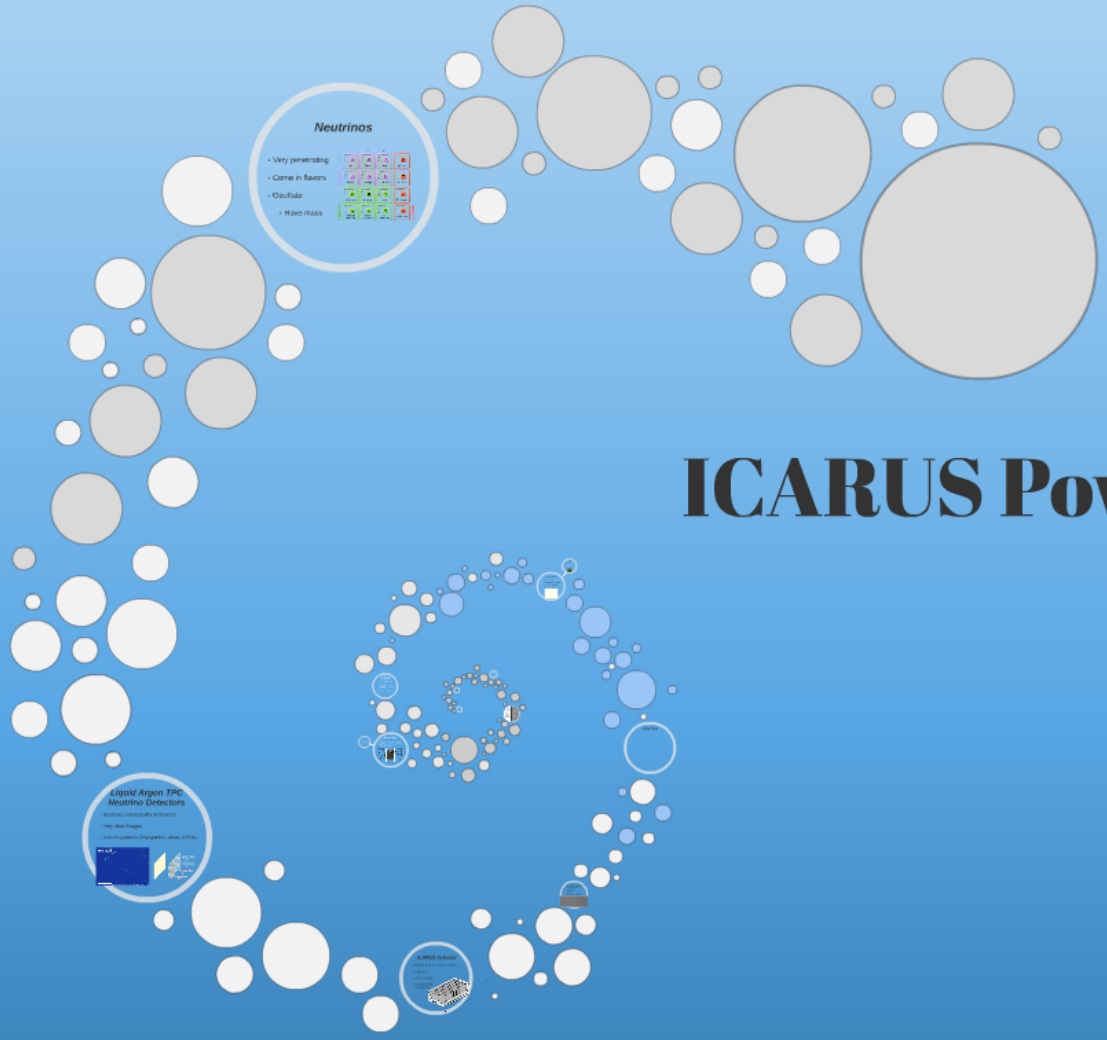


ICARUS Power Supply

Joseph Carolan
Naperville North
Maritza Gallegos
Plainfield South
Maggie Barclay
Bradley-Bourbonnais

Prezi



ICARUS Power Supply

Joseph Carolan
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Bradley-Bourbonnais

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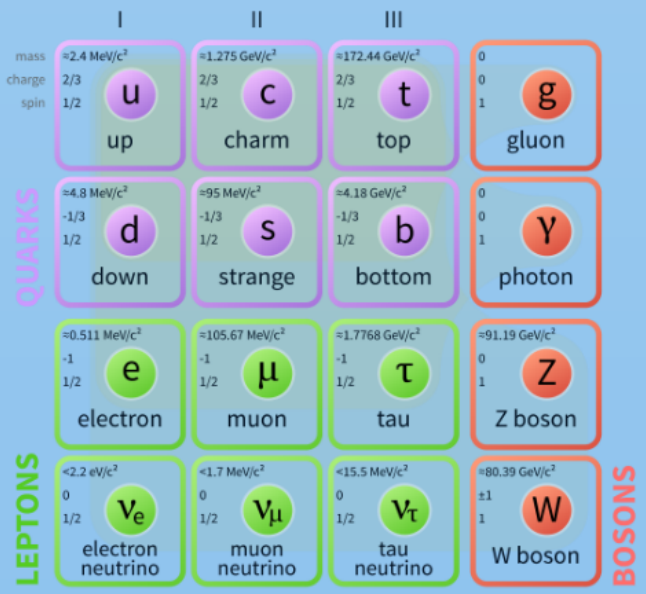
Neutrinos

- Very penetrating
- Come in flavors
- Oscillate
  - Have mass



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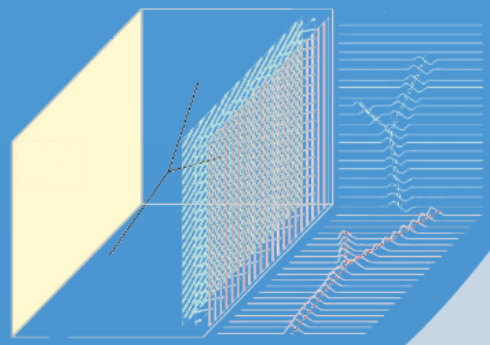
Liquid Argon TPC Neutrino Detectors

- Neutrinos interact with Ar Neuclei
- Very clear images
- Lots of systems (Cryogenics, wires, CPUs)



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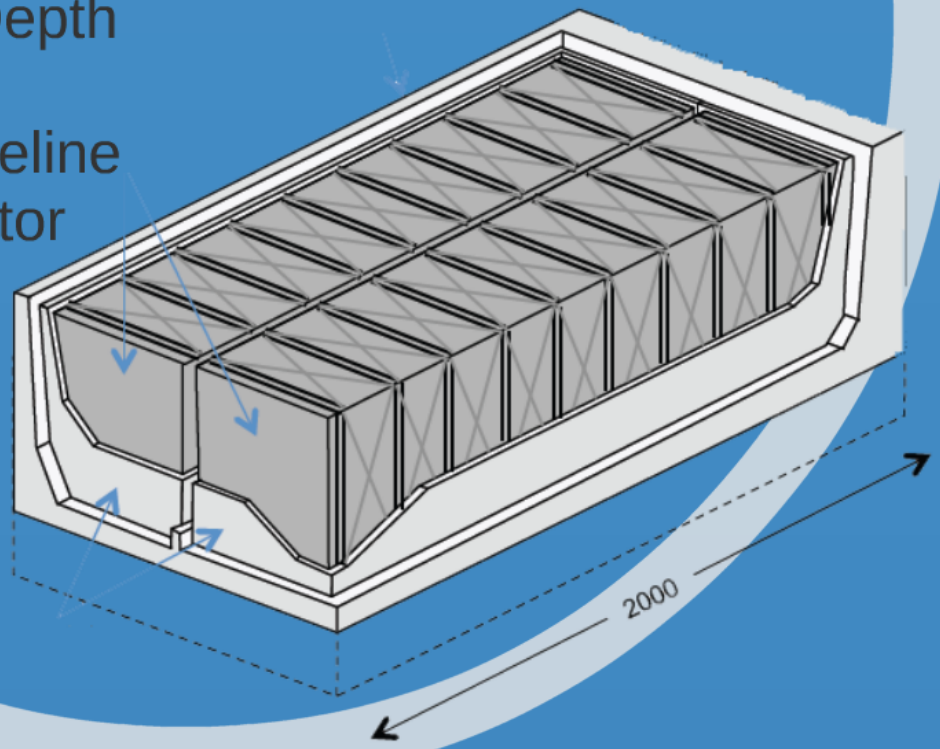
ICARUS Detector

- Only liquid Ar detector with >600 L
- Very cold
- Shallow Depth
- Short Baseline Far Detector



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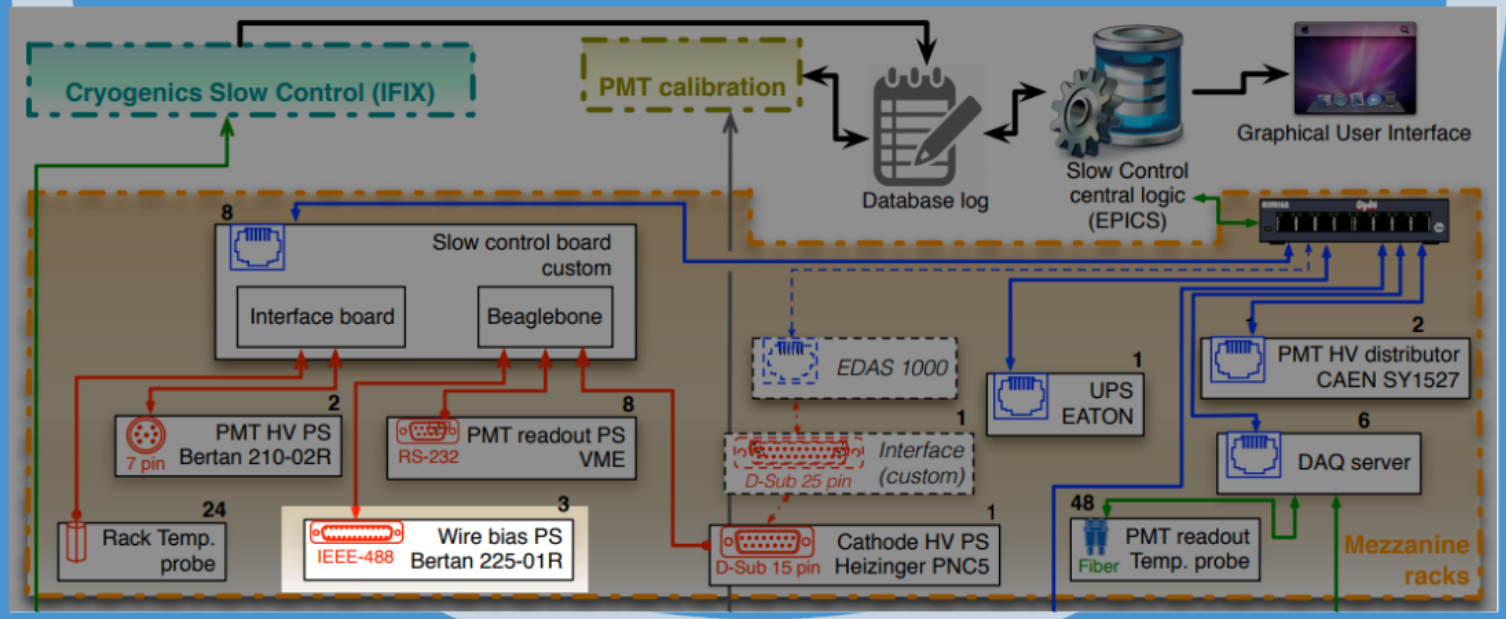
Our Contribution

- Remote control of a power supply
- Readback values
- Set values
- Produce alarms and notifications



Data Flow

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Power Supply

- 0-120 V, 0-1.5 A, DC
- GPIB input/output (ethernet adapter)
- Interact directly through shell
- No UI

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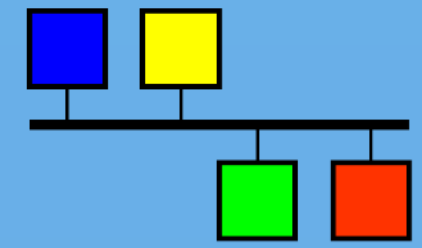
EPICS

- Control systems for scientific experiments
- Client/Server
- Real time values
- Easy to access and change



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Control System Studio (CSS)

- Interactive project-user interface
- Real-time values
- JavaScript & python embedded code
- C++ to debug
- Output -> GUI with practical features

JavaScript

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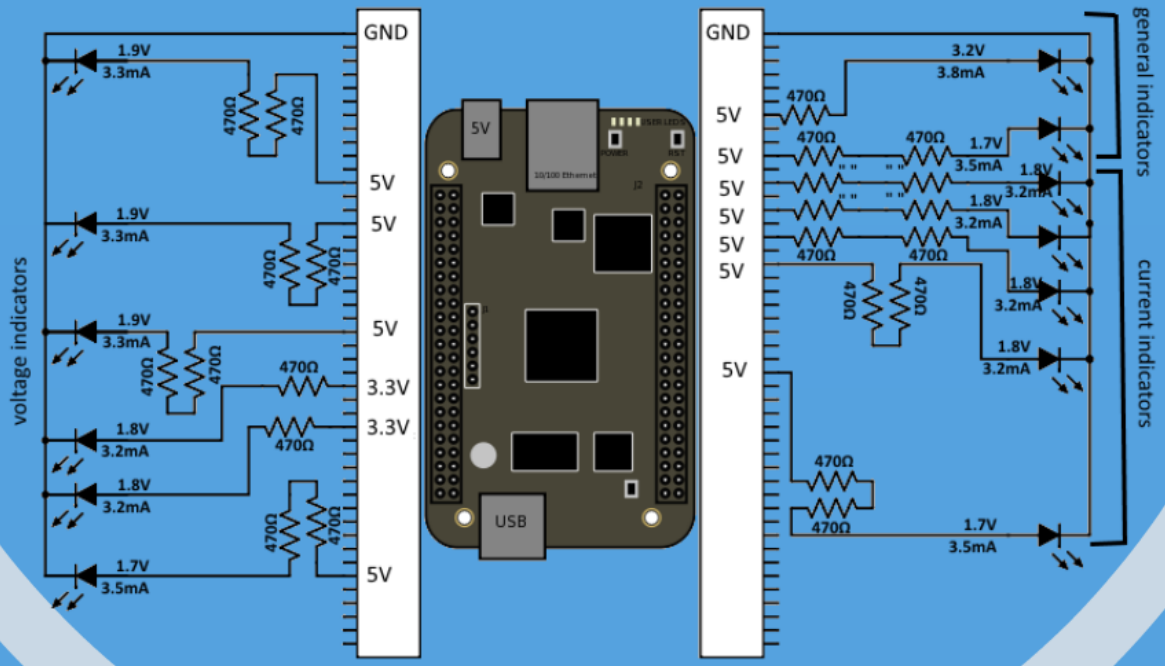
BeagleBone

Equipment:

- BeagleBone Black (3.3V & 5V GPIO pins)
- Breadboards, LEDs, 470 Ohm Resistors
- Python Code (through PyEpics)
- Database process variables



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Output:

- Indicator lights (incrementing voltage and current, warning lights (hihi, lolo, hi, lo), power)
- Real-time value readback through web interface

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CSS

- interactive & user friendly
- password protection
- useful for control room monitoring & changes to project by expert
- easily exportable data

BeagleBone

- physical alarm
- more lightweight
- less interactive
- needs web interface for specific values
- useful for control room monitoring

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Accomplishments

- Monitor power supply
- Set values and ramp
- Export data
- Send alerts

Next Steps

- Integration with detector
- Intuitive save-recall states
- Smart data saving

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Thank you

Angela Fava

ND SCIENTIST
QUARKNET MENTOR

Dennis Nicklaus

ENGINEER

Donatella Torretta

ND OPS SUPPORT GROUP

George Dzuricsko

QUARKNET TEACHER

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References

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