

# NPS Components

NC A&T

- ❑ a ~25 msr neutral particle detector consisting of ~1100 PbWO<sub>4</sub> crystals in a temperature-controlled frame – using PRIMEx crystals or new .

MRI 2015

MRI 2015

- ❑ HV distribution bases with built-in amplifiers for operation in a high-rate environment – new

JLab

- ❑ Essentially deadtime-less digitizing electronics to independently sample the entire pulse form for each crystal – JLab-developed Flash ADCs

MRI 2015

- ❑ Two new sweeping magnets, one horizontal bending with ~0.3 Tm field strength, and one vertical bending with ~0.6 Tm field strength for larger angles/WACS. Both designed to use an existing power supply

EU

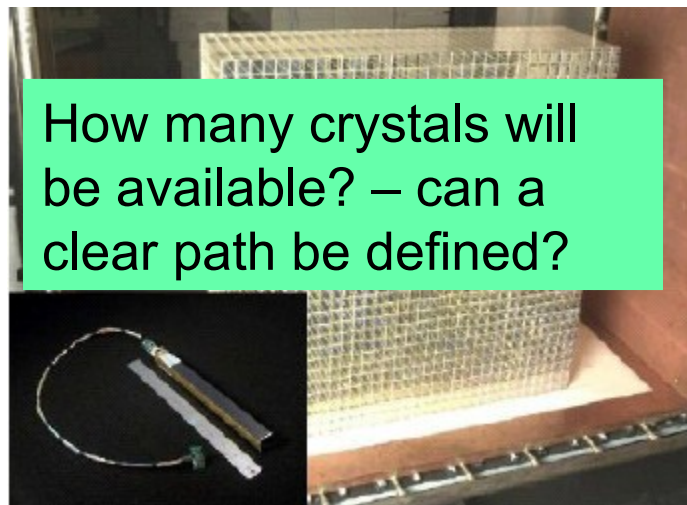
JLab

- ❑ Cantelevered platform off the SHMS carriage to allow for remote rotation (in the small angle range), and platforms to be on the SHMS carriage (in the large angle range) – new

JLab

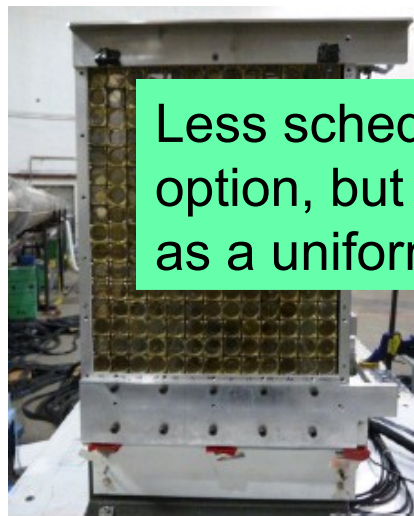
- ❑ A beam pipe with as large critical angle as possible to reduce beamline-associated backgrounds – further study showed only a small section needs modification (JLab/Hall C)

# NPS Crystal Matrix

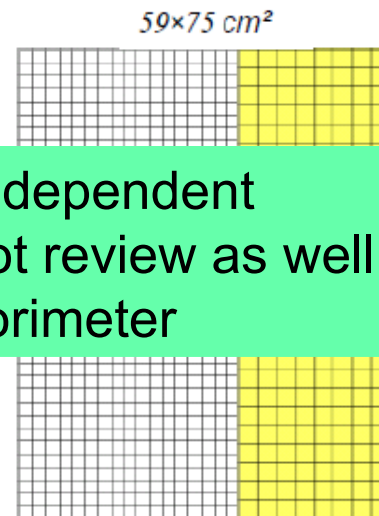


How many crystals will be available? – can a clear path be defined?

High resolution PbWO<sub>4</sub> part from HyCAL



DVCS/Hall A PbF<sub>2</sub> calorimeter



NPS hybrid crystal matrix

\$1000-\$3000 per crystal

Can manufacturers provide the quality needed?

- In ideal conditions would start with brand new PbWO<sub>4</sub>
- Taking advantage of existing PbWO<sub>4</sub> crystals from HyCAL, one arrangement is in a 36x30 matrix covering 25 msr at distance of 4 m from target (~1100 crystals)
- Could use PbF<sub>2</sub> crystals from DVCS/Hall A to fill out solid angle if only ~600 PbWO<sub>4</sub> available

# MRI 2015 Draft Budget

Item	Quantity	Funds requested	University Cost Share
PbWO4	60	90,090	38,610
PMT+mag. Shield	60	21,021	9,009
PMT voltage dividers	630	63,063	27,027
Amplifiers	630	3,468	1,486
Magnet Construction	1	121,781	52,192
Temperature Controlled Frame	1	45,045	19,305
Cooler System for Frame	1	11,011	4,719
Motion Controller	1	8,008	3,432
Light monitoring system	1	44,044	18,876
UV curing system	1	40,040	17,160
<b>TOTAL</b>		<b>447,571</b>	<b>191,816</b>

OU      ODU      CUA

# NPS Funding Discussion

- ❑ Short term goal is to (re)submit a proposal to the NSF MRI 2015 competition.  
Due date is 22 January 2015
- ❑ (Re)submit also to EU opportunities in 2015?
- ❑ What to do about PbWO<sub>4</sub> crystals?
  - ❑ How many crystals are available from NC A&T on what timescale?
  - ❑ Could we consider crystals being available from JLab?
  - ❑ If some but not full funding was available to purchase PbWO<sub>4</sub> would a combination of new and existing HyCal crystals be ok?
    - Can SICCAS provide the crystal quality needed?
    - Would Crytur be an alternative?