

# Hall-C Summer Physics Workshop

- Hall C has no official collaboration structure, rather a user community
- Hall C has a Steering Committee
  - Betsy Beise (UMd)
  - Donal Day (UVa)
  - Joerg Reinhold (FIU, Chair)
  - Wim van Oers (Manitoba)
- Main tasks
  - Provide effective channel of communication
  - Represent the interests of Hall C users and Hall C
  - Organize annual Hall C physics workshop
- January Hall C “nuts + bolts” User Meeting:  
January 06 + 07 (?)

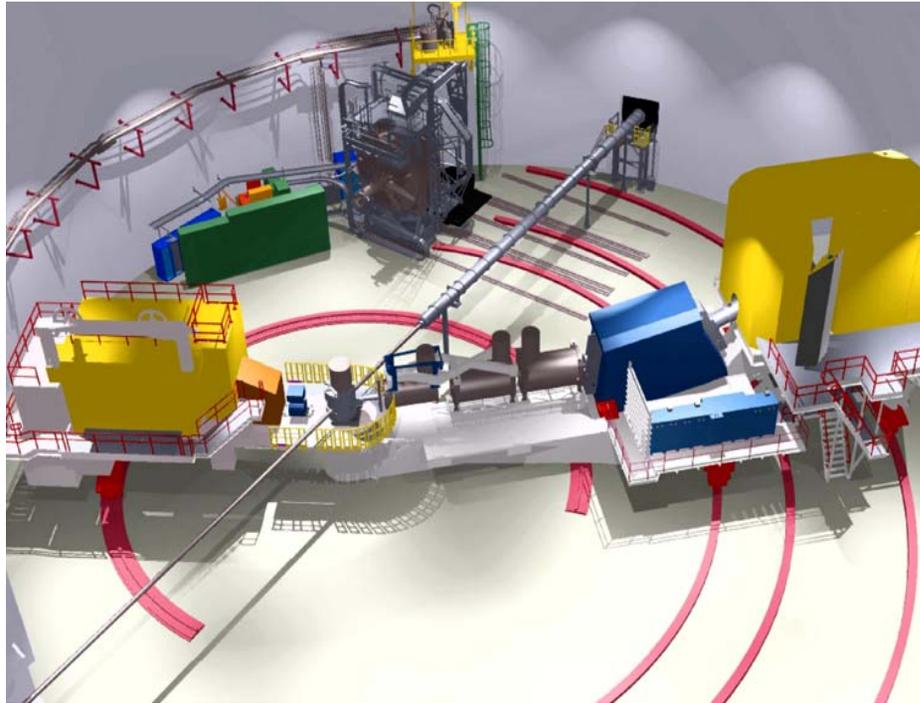
# Hall C Research Program



- Have been running experiments since November 1995
- 521 PAC Days run, or 23.1 experiments (July 4, 2004)
- 335 PAC Days in queue, or 15.9 experiments  
(8 large-scale installations)  
(Backlog: 4.8 Years)
- 59 PAC Days on 2004/5 schedule (0.8 years)
- 62 Ph.D. Subjects, 46 Ph.D.'s awarded
- 32 refereed publications to date (17 PRL), 3 submitted  
(not including NIM papers)
- 6 Large Installations to date:  $t_{20}$ ,  $G_E^n$ -98, HNSS,  
 $G_E^n$ -00,  $G_E^n$ -01, G0 (x2)
- 324 Active users representing 18 different countries

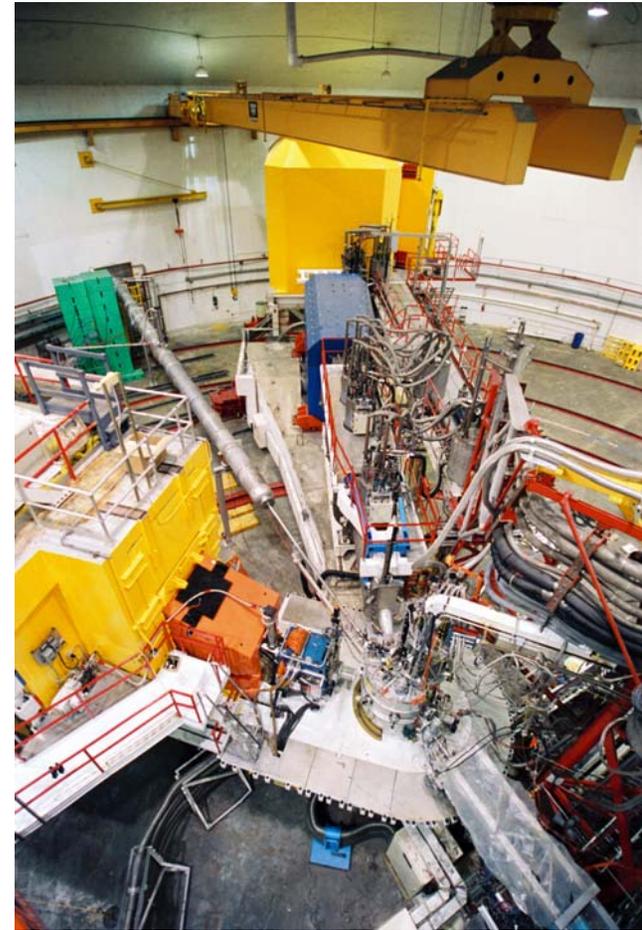
# Experimental Hall C

At the present 6 GeV Beam Energy



*Hall C's High Momentum Spectrometer, Short Orbit Spectrometer and specialized equipment for studying:*

- The strange quark content of the proton
- Form factors of simple quark systems
- The transition from hadrons to quarks
- Nuclei with a strange quark embedded



G0

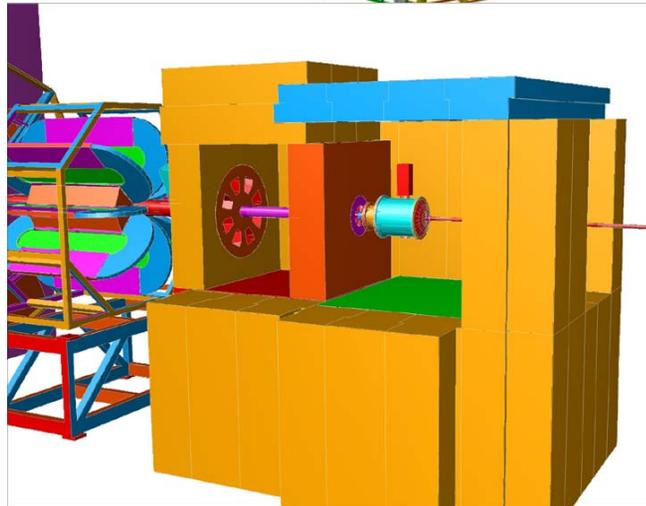
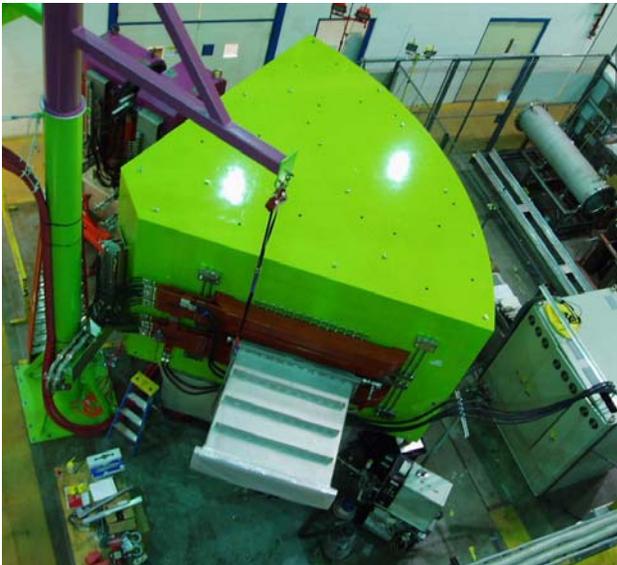
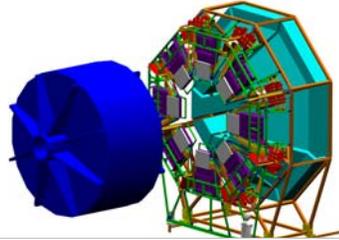
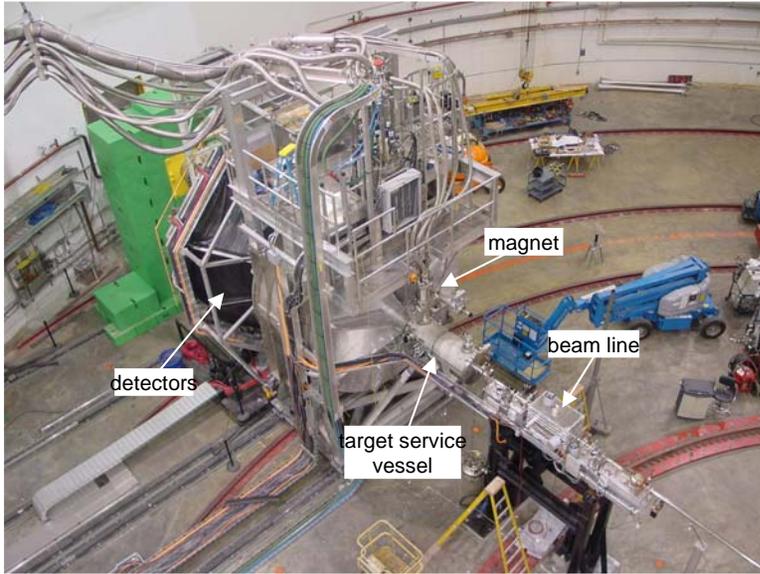
$F^\pi$ ,  $G_E^{n-98}$ ,  $G_E^{n-00}$ ,  $G_E^{n-01}$ ,  $G_E^{p-III}$ ,  $G_E^n$  at high  $Q^2$ ,  $t_{20}$   
D photodisintegration, Quark-Hadron Duality

D, He(e,e'K<sup>+</sup>), HNSS, HKS

+ Qweak, SANE, Semi-SANE



# Home of the Large Installations



# "Upcoming" Program in Hall C

DATE	EXP	PROGRAM	SPOKESPERSON
June, 2004	E01-109	$G_E^p/G_M^p$ to $Q^2 = 9 \text{ GeV}^2$ BigCal-HMS test	E. Brash, M. Jones, C. Perdrisat, V. Punjabi
June	E02-019	$x > 1$ at high $Q^2$ Part I at 5 GeV	J. Arrington, D. Day, B. Filippone, A. Lung
July	E01-107	Pion Transparency in Nuclei Part I at 5 + 4 GeV	D. Dutta, K. Garrow, R. Ent
August-September		Maintenance, G0 Turnaround	
September-November	E02-019	$x > 1$ at high $Q^2$ Part II at 5.75 GeV	J. Arrington, D. Day, B. Filippone, A. Lung
November-December	E03-103	EMC Effect in Light Nuclei	J. Arrington, D. Gaskell
December	E01-107	Pion Transparency in Nuclei Part II at 5.75 GeV	D. Dutta, K. Garrow, R. Ent
January-May1, 2005		HKS Experiment Installation	
May-July	E01-011	Spectroscopy Study of Medium to Medium-Heavy Mass $\Delta$ Hypernuclei	O. Hashimoto, S. Nakamura, J. Reinhold, L. Tang



# Long-Term Experiment Schedule



2005

- Hypernuclear Physics
  - HKS Experiment (Hashimoto, Nakamura, Reinhold, Tang) (1.8-2.0 GeV)
  - Fission Detector Test (Margaryan, Tang)

2006

- Transition to E04-115 Experiment (Beck, G0 Backward)
- G0 Backward Run (0.8 GeV)
- Transition to E04-108 Experiment
- GEp-III Run (Perdrisat, Brash, Jones, Punjabi)

2007

- 2-g Exchange Run intermixed?
- HMS/SOS L/T Runs? (Bodek, Christy, Keppel)
- Polarized Target Runs

2008

- SANE ( $g_2$  at high  $Q^2$ ) Run (Rondon, Meziani, Choi)
- Semi-SANE (flavor decompositions) Run

2009

(Jiang, Bosted, Day, Jones)

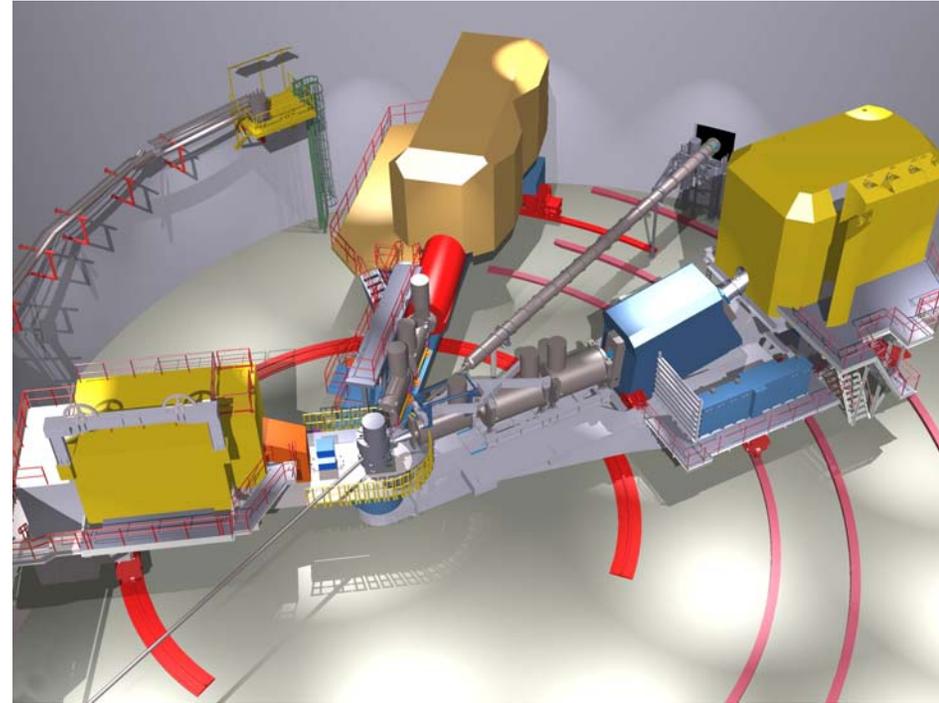
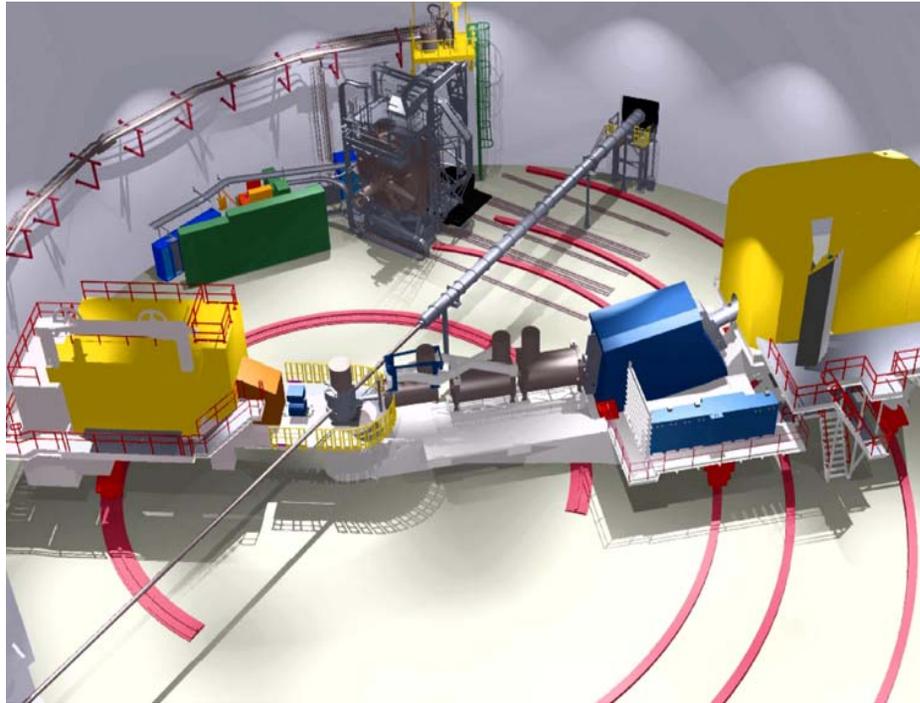
2012?

- Start 12-GeV Program?
- Qweak (Bowman, Carlini, Finn, Kowalski, Page) Phase I
- GEn Run (Madey, Anderson, Kowalski, Semenov)

# Experimental Hall C

At the present 6 GeV Beam Energy

After the 12-GeV Upgrade



*Hall C's High Momentum Spectrometer, Short Orbit Spectrometer and specialized equipment for studying:*

- *The strange quark content of the proton*
- *Form factors of simple quark systems*
- *The transition from hadrons to quarks*
- *Nuclei with a strange quark embedded*

*Add a Super-High Momentum (11 GeV) Spectrometer for studying:*

- *Super-fast quarks*
- *Form factors of simple quark systems*
- *The transformation of quarks into hadrons*
- *Quark-quark correlations*

## 12-GeV Work Beyond CD-0

Up to now Hall C tried to stay orthogonal to physics of other Halls:

- emphasized L/T separations and large  $z$  ( $= E_h/v$ ) physics
- well suited to 11 GeV/c SHMS with "smooth" acceptance and rigid connection to pivot
- Hall C pCDR ~100 pages, i.e. concise, as was **original** guideline (for reference: Hall B 230 pages, Hall A 200 pages...)

Need to now show **full** physics package, i.e. go beyond orthogonal package of exclusive reactions and L/T separations: cf. Antje Bruell's talk later.

**Since May, 2004**, Bi-weekly meetings of Physics Staff and interested users to get work organized and in motion (simulation packages mostly available!) → Fridays 9:00 am - 10:30 am

### Present "Schedule":

- Update draft CDR with **full** Hall C physics package (Realistic Simulations of New and "Old" Physics)
- Contact Editors of relevant Physics Topic to be included
- Update Cost Book (Antje Bruell et al., since ~ 1 week)
- January 2005: PAC reviews new 12-GeV physics ideas
- Early 2005: DOE Review of 12-GeV Science Case
- Later 2005: "Lehman Review" of Full 12-GeV Project