

# SoLID Collaboration Meeting '24 – Website and Documentation

June-21-2024



## Redesign Website - <https://solid.jlab.org/>

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- At a minimum, the front page should contain a SoLID science summary
- The detector and the science within 2 pages, well articulated through examples
- Wiki page not up to date – for instance, collaboration lists very outdated
- Documentation in DocDB not up to date – last entries in 2023

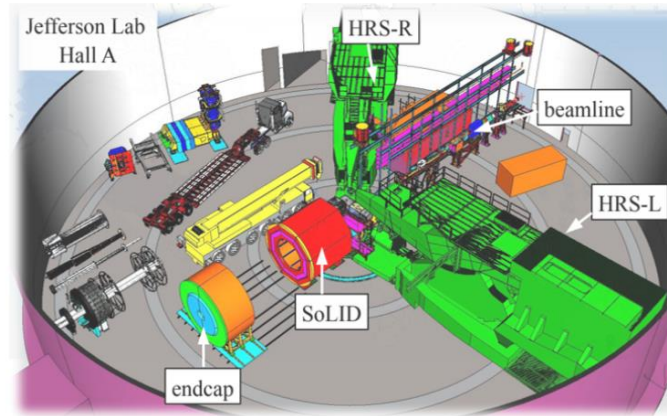
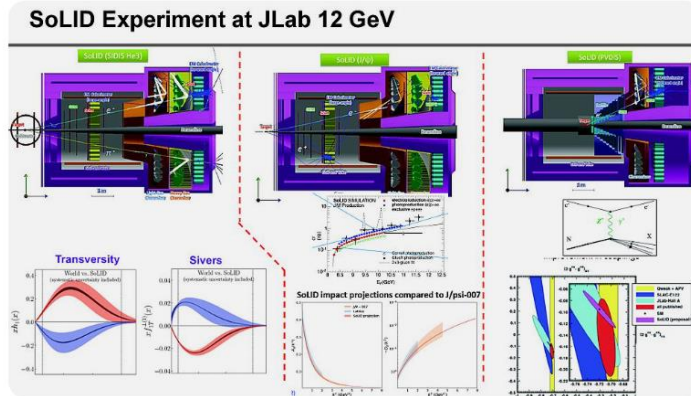
# Redesign Website - <https://solid.jlab.org/>

- Website can be redesigned via
  - HTML editor → cumbersome
  - WYSIYG editor → vary in functionality and price
- Current website was generated by “[Jekyll v4.0.1](#)”
- I chose a quasi-free responsive website builder software (WYSIWYG editor)
- Need to build website from scratch
- Takes time to build

The screenshot shows the Jekyll website homepage. At the top, there is a navigation bar with links for HOME, DOCS, RESOURCES, SHOWCASE, and NEWS, along with a search bar. The main heading reads "Transform your plain text into static websites and blogs." Below this, there are three feature cards: "Simple" (No more databases, comment moderation, or pesky updates to install—just your content.), "Static" (Markdown, Liquid, HTML & CSS go in. Static sites come out ready for deployment.), and "Blog-aware" (Permalinks, categories, pages, posts, and custom layouts are all first-class citizens here.). Each card has a corresponding link: "How Jekyll works →", "Jekyll template guide →", and "Migrate your blog →". At the bottom, there is a dark red banner with the text "Get up and running in seconds." and a terminal window titled "Quick-start Instructions" showing the following commands: 

```
~ $ gem install bundler jekyll
~ $ jekyll new my-awesome-site
~ $ cd my-awesome-site
~/my-awesome-site $ bundle exec jekyll serve
# => Now browse to http://localhost:4000
```

# Redesign Website - <https://solid.jlab.org/>

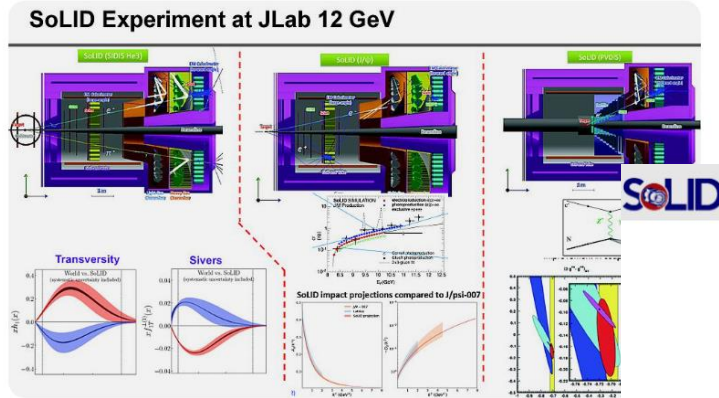


The planned SoLID detector is a large acceptance forward scattering spectrometer with full azimuthal angular coverage capable of handling high luminosities ( $10^{37} - 10^{39}/\text{cm}^2/\text{s}$ ) with a variety of polarized and unpolarized targets. The detector will exploit the full potential of the JLab 12 GeV upgrade with programs in 3D imaging of the nucleon, beyond standard-model searches and exploration of gluonic forces.



## SIDIS

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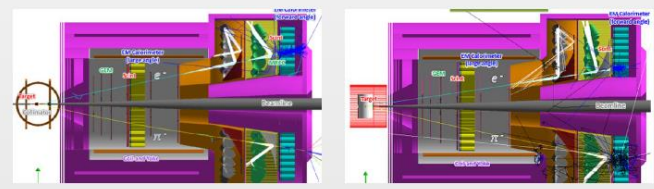


potential of the JLab 12 GeV upgrade with programs in 3D imaging of the nucleon, beyond standard-model searches and exploration of gluonic forces.

## SIDIS

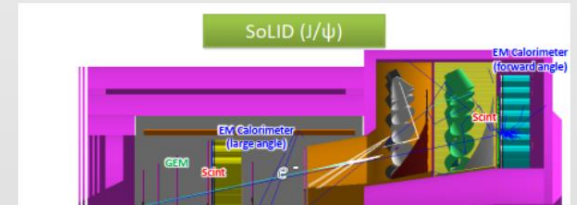
Researchers utilizing the SoLID device will extract transverse momentum distributions (TMDs) utilizing Semi-Inclusive Deep Inelastic Scattering using polarized beams and  $^3\text{He}$  and  $\text{NH}_3$  targets. A series of experiments will probe the confined motions (3-D imaging) of partons inside protons and neutrons including orbital motion, and uncover the rich QCD dynamics such as spin-orbital correlations. The flavor separated u and d quark tensor charges determined from the transversity TMD will allow for tests of Lattice QCD predictions and unique Standard Model tests when combined with nucleon electric dipole moments.

Click on the thumbnails to see the full image.



## J/ψ

J/ψ production near threshold will provide information on the pure gluonic component of QCD and add understanding of the nature of the charmed pentaquark states observed at LHCb.



# Redesign Website - <https://solid.jlab.org/>

## SoLID Experiments

The core research areas for the SoLID detector are Parity Violating Deep Inelastic Scattering (PVDIS), Semi-Inclusive Deep Inelastic Scattering (SIDIS), and near threshold J/Psi Electroproduction. Five proposals in these areas have been approved as experiments by the JLab Program Advisory Committee (PAC). In addition, a number of proposals have been approved to run in parallel to these experiments requiring no additional beam time. These Run Group Experiments have been approved by the SoLID technical Advisory Committee (TAC) and the JLab PAC.



## Experiments

- PVDIS(E12-10-007)  
[Submission at PAC 34](#), [Update at PAC 35](#), [Update at PAC 37](#), Approved for 169 days (of 338 requested) with a rating of A.
- SIDIS
  - SIDIS with Transversely Polarized  $^3\text{He}$ (E12-10-006)  
[Submission at PAC 34](#), [Update at PAC 35](#), [Update at PAC 38](#), approved for 90 days with a rating of A
  - SIDIS with Longitudinally Polarized  $^3\text{He}$ (E12-11-007)  
[Submission at PAC 37](#), [Update at PAC 38](#), approved for 35 days with a rating of A
  - SIDIS with Transversely Polarized Proton (E12-11-108)  
[Submission at PAC 38](#), [Update at PAC 39](#), approved for 120 days with a rating of A
- J/Psi (E12-12-006)  
Near Threshold Electroproduction of J/Psi at 11 GeV, [Submission at PAC 39, 2012](#), approved 60 days; [Submission at PAC 50, 2022 - Jeopardy Experiments](#) with a new rating of A
- BNSSA (PR12-22-004)  
Measurement of the Beam Normal Single Spin Asymmetry in Deep Inelastic Scattering using the SoLID Detector, [Submission at PAC 50, 2022](#), approved 38 days with a rating of A-

## Other Physics Channels

# Redesign Website - <https://solid.jlab.org/>

## SoLID Experiments

The core research areas for the SoLID detector are Parity Violating Deep Inelastic Scattering (PVDIS), Semi-Inclusive Deep Inelastic Scattering (SIDIS), and near threshold J/Psi Electroproduction. Five proposals in these areas have been approved as experiments by the JLab Program Advisory Committee (PAC). In addition, a number of proposals have been approved to run in parallel to these experiments requiring no additional beam time. These Run Group Experiments have been approved by the SoLID technical Advisory Committee (TAC) and the JLab PAC.



## Experiments

- PVDIS(E12-10-007)  
[Submission at PAC 34](#), [Update at PAC 35](#), [Update at PAC 37](#), Approved
- SIDIS
  - SIDIS with Transversely Polarized  $^3\text{He}$ (E12-10-006)  
[Submission at PAC 34](#), [Update at PAC 35](#), [Update at PAC 38](#), approved
  - SIDIS with Longitudinally Polarized  $^3\text{He}$ (E12-11-007)  
[Submission at PAC 37](#), [Update at PAC 38](#), approved for 35 days
  - SIDIS with Transversely Polarized Proton (E12-11-108)  
[Submission at PAC 38](#), [Update at PAC 39](#), approved for 120 days
- J/Psi (E12-12-006)  
Near Threshold Electroproduction of J/Psi at 11 GeV, [Submission at PAC 38](#), new rating of A
- BNSSA (PR12-22-004)  
Measurement of the Beam Normal Single Spin Asymmetry in Deep Inelastic Scattering, rating of A-

## Other Physics Channels

## Other Physics Channels

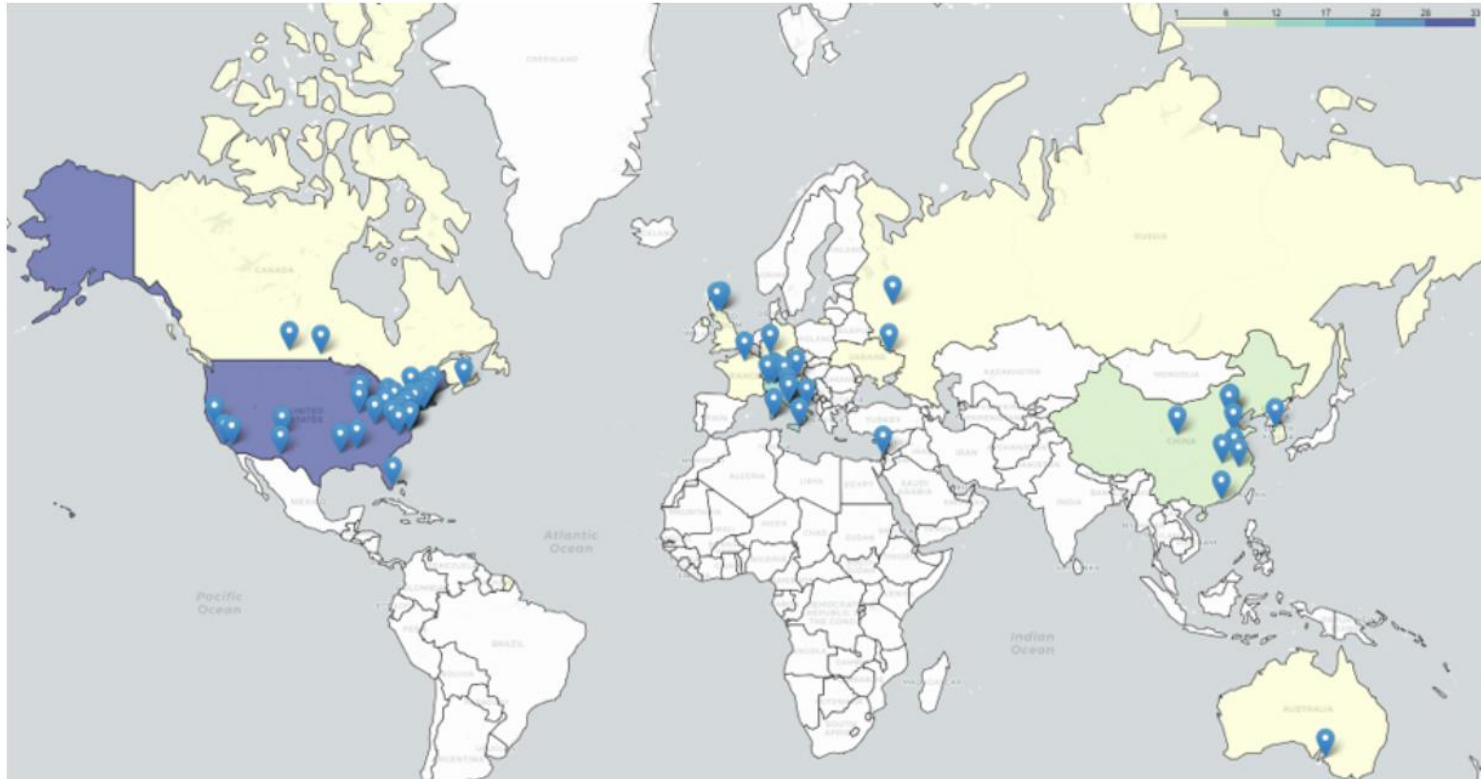
Conditionally approved (C2), letters of Intent, Deferred Proposals and possibilities.

- EMC Effect in Parity Violating DIS (PVEMC)  
Deeply Virtual Compton Scattering (DVCS)  
Deferred proposals [PR12-16-006](#) and [PR12-14-007](#)
- Parity Violating DIS on polarized  $^3\text{He}$   
Letter of Intent: [LO12-16-007](#)
- Deeply Virtual Compton Scattering (DVCS)  
[DVCS with polarized targets](#)
- Double Deeply Virtual Compton Scattering (DDVCS)  
DDVCS on proton ([LO12-12-005](#)) Letter of Intent to PAC 43, 2015. Would run first as a run group experiment with J/Psi(E12-12-006) and then as a dedicated experiment.
- First Measurement of the Flavor Dependence of Nuclear PDF Modification Using Parity-Violating Deep Inelastic Scattering  
C2 approved by PAC 50 ([PR12-22-002](#)).

## Run Group Experiments

- SIDIS Dihadron with Transversely Polarized  $^3\text{He}$  (E12-10-006A)  
[Submission to SoLID TAC and PAC 42, 2014](#), approved as a run group with E12-10-006.
- SIDIS in Kaon Production with Transversely Polarized Proton and  $^3\text{He}$  (E12-11-108B/E12-10-006D)  
[Submission to SoLID TAC and PAC 46, 2018](#), conditionally approved as a run group experiment with E12-11-108 and E12-10-006.
- Ay (E12-11-108A/E12-10-006A)  
Target Single Spin Asymmetry Measurements in the Inclusive Deep-Inelastic Reaction on Transversely Polarized Proton and Neutron ( $^3\text{He}$ ) Targets using the SoLID Spectrometer  
[Submission to SoLID TAC and PAC 42, 2014](#), approved as run group with E12-10-006 and E12-11-108.
- g2n and d2n (E12-11-007A/E12-10-006E)  
Measurement of Inclusive g2n and d2n with SoLID on a Polarized  $^3\text{He}$  Target. [Submission to SoLID TAC and PAC 48, 2020](#), approved as a run group experiment with E12-11-007 and E12-10-006.
- Deep Exclusive Meson Production (E12-10-006B) (DEMP)  
Measurement of Deep Exclusive Pi- Production using a Transversely Polarized He3 Target and the SoLID Spectrometer, [Submission at SoLID TAC and PAC 45, 2017](#), approved as run group with E12-10-006.
- Timelike Compton Scattering (E12-12-006A) (TCS)  
TCS with circular polarized beam and unpolarized LH2 target, [Submission at SoLID TAC and PAC 43, 2015](#), approved as run group with J/Psi(E12-12-006).

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SoLID collaborators are coming from 66 institutes, from 13 countries in 4 continents.

- [Full collaboration](#)
- [SIDIS-Longitudinal-He3 Collaboration](#)
- [SIDIS-Transverse-He3 Collaboration](#)
- [SIDIS-Transverse-Proton Collaboration](#)
- [PVDIS Collaboration](#)
- [J/Psi Collaboration](#)



## SoLID Pre-R&D

The Goal of the pre-R&D plan for the SoLID spectrometer is to mitigate the primary technical, schedule and cost risks in advance of the project start. These risks are due to the large scale of the project, as well as the requirement for operation at high luminosity. The pre-R&D plan covers the high rate electronic and DAQ system and the gas Cherenkov detectors which are two systems with identified potential risks.

For the DAQ system, there are two main issues. First, the initially proposed readout chip for the GEM readout in the earlier version of the SoLID pre-CDR is obsolete and a new modern chip has been identified as a suitable replacement. The pre-R&D tests will allow us to be sure the new chip based readout system satisfy the SoLID DAQ requirements. Second, we need a small-scale test stand of the DAQ system to study the DAQ system performance and support the detector tests in order to find out if they will be able to meet the demanding requirements in the high-rate environment. This will impact the trigger and readout of the major systems, including the gas Cherenkovs (light and heavy), calorimeter, and time-of-flight detectors.

The gas Cherenkov detectors are critical for creating efficient triggers and providing particle identification in the high-rate environment of SoLID. The SoLID light gas and heavy gas Cherenkovs designs use square shaped photosensors known as multi-anode photomultiplier tubes (MaPMTs) in order to cover a large area through tiling. The high level of pixelization of the these photo sensors can potentially help reduce backgrounds. We plan to build and test a telescopic Cherenkov device to verify that the proposed Cherenkov detectors can reach the desired performance in the high-rate environment. The available granularity of the photosensors can provide an improved performance in rejecting background in the harsh environment of high luminosity.

The following reports are accessible via DocDB.

1. [Pre-R&D plan](#)
2. [First quarterly report](#)
3. [Second quarterly report](#)
4. [Third quarterly report](#)
5. [Fourth quarterly report](#)
6. [Fifth quarterly report](#)
7. [Sixth quarterly report](#)

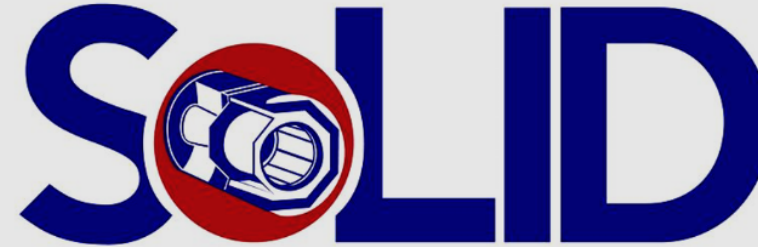
## Testbeam Efforts

The Goal of the pre-R&D plan for the SoLID spectrometer is to mitigate the primary technical, schedule and cost risks in advance of the project start. These risks are due to the large scale of the project, as well as the requirement for operation at high luminosity. The pre-R&D plan covers the high rate electronic and DAQ system and the gas Cherenkov detectors which are two systems with identified potential risks.

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## SoLID Publications



[2014 White Paper on SoLID \(Solenoidal Large Intensity Device\)](#)

[2022 White Paper on SoLID \(Solenoidal Large Intensity Device\)](#)

[Experimental constraint on quark electric dipole moments \(Phys. Rev. D \*\*97\*\*, 074018 \(2018\)\)](#)

[Nucleon 3D imaging program with SoLID at Jefferson Lab \(SPIN 2018\)](#)

[Probing BSM and High-x Physics with SoLID at JLab \(CIPANP 2018\)](#)

[Electromagnetic Calorimeter Prototype for the SoLID Project at Jefferson Lab \(TIPP 2017\)](#)

[An optimized prototype of electromagnetic calorimeter for the SoLID project at Jefferson Lab \(CHEF 2017\)](#)

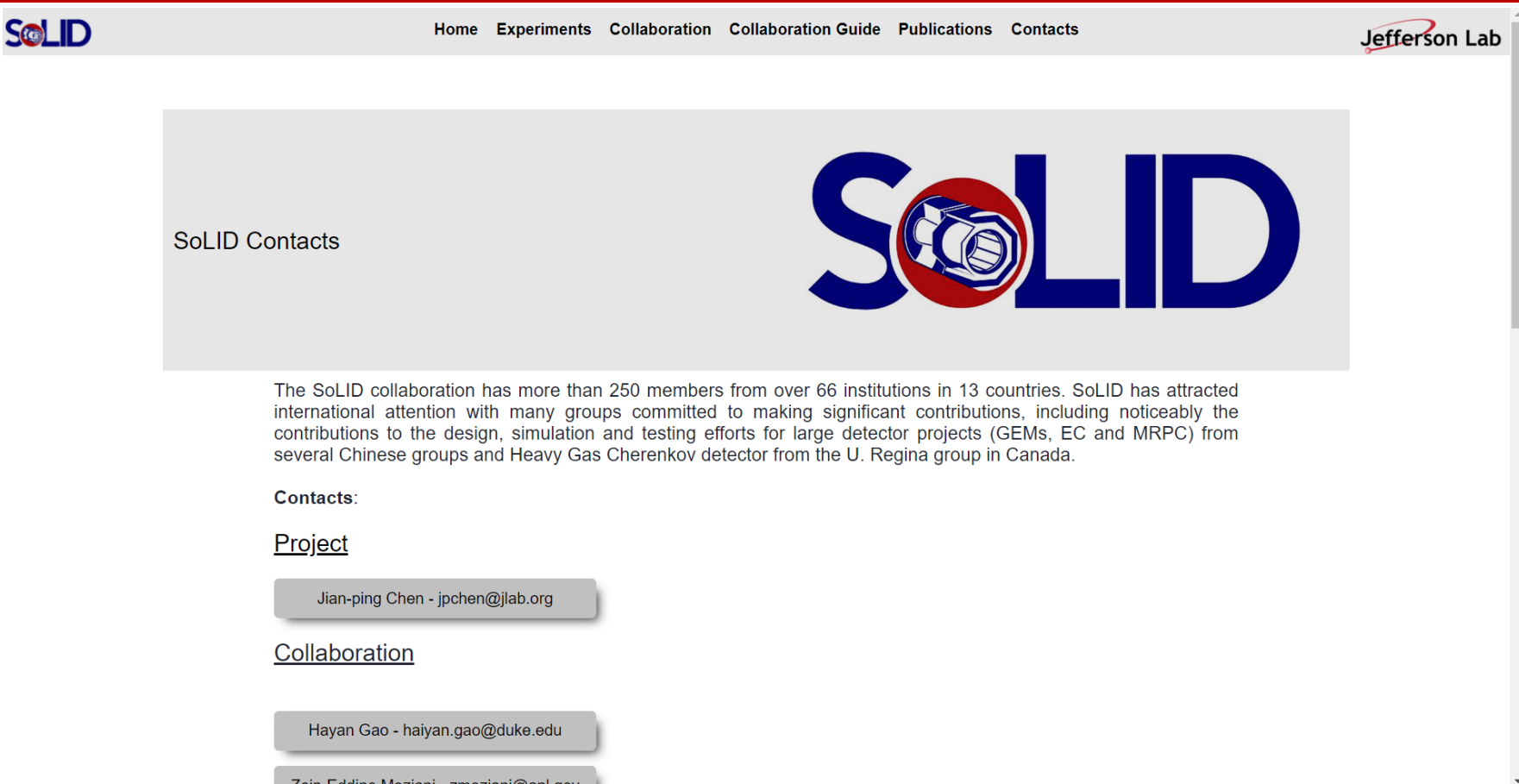
[Unveiling the nucleon tensor charge at Jefferson Lab: A study of the SoLID case \(Phys. Lett. B \*\*767\*\* 91 \(2017\)\)](#)

[TMD Physics at 12-GeV Jefferson Lab with SoLID Proceedings \(DIS 2016\)](#)

[Parity Violation in Deep Inelastic Scattering with the SoLID Spectrometer at JLab \(SPIN 2016\)](#)

[Parity Violation in Deep Inelastic Scattering with the SoLID Spectrometer at JLab \(SPIN 2014\)](#)

# Redesign Website - https://solid.jlab.org/




The screenshot shows the homepage of the SoLID website. At the top, there is a navigation bar with the following links: Home, Experiments, Collaboration, Collaboration Guide, Publications, and Contacts. The SoLID logo is on the left, and the Jefferson Lab logo is on the right. Below the navigation bar is a large banner featuring the SoLID logo, which consists of the word "SoLID" in blue, with a red circle containing a blue and white bolt and nut in the center of the letter "O". To the left of the banner, the text "SoLID Contacts" is displayed. Below the banner, there is a paragraph of text describing the SoLID collaboration. Underneath the text, there is a section titled "Contacts:" followed by a sub-section titled "Project" with a button for "Jian-ping Chen - jpchen@jlab.org". Below that is a sub-section titled "Collaboration" with buttons for "Hayan Gao - haiyan.gao@duke.edu" and "Zain Eddine Meziani - zmeziani@cefn.gov".

Home Experiments Collaboration Collaboration Guide Publications Contacts

Jefferson Lab

SoLID Contacts



The SoLID collaboration has more than 250 members from over 66 institutions in 13 countries. SoLID has attracted international attention with many groups committed to making significant contributions, including noticeably the contributions to the design, simulation and testing efforts for large detector projects (GEMs, EC and MRPC) from several Chinese groups and Heavy Gas Cherenkov detector from the U. Regina group in Canada.

**Contacts:**

Project

Jian-ping Chen - jpchen@jlab.org

Collaboration

Hayan Gao - haiyan.gao@duke.edu

Zain Eddine Meziani - zmeziani@cefn.gov

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## SoLID Contacts

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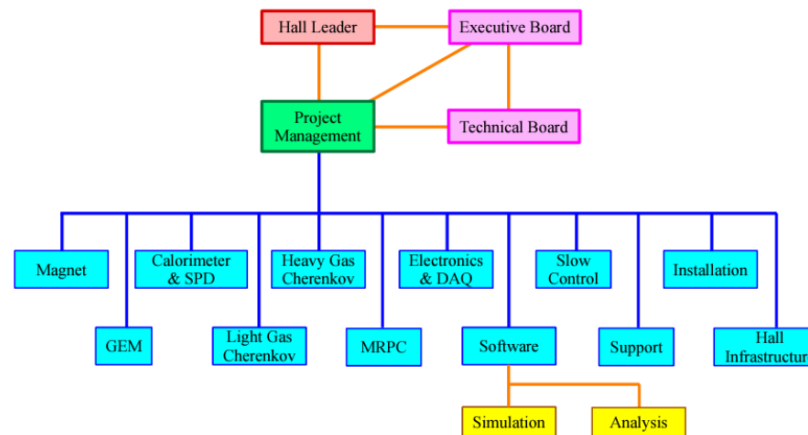
Zein-Eddine Meziani - zmeziani@anl.gov

Hayan Gao - haiyan.gao@duke.edu

Zein-Eddine Meziani - zmeziani@anl.gov

Paul Souder - souder@physics.syr.edu

Xiaochao Zheng - xz5y@virginia.edu



#### Sub-System Lead Coordinators and Institutions

- **Magnet:** Whit Seay and Jay Benesch; *JLab*
- **GEM:** Nilanga Liyanange and Klaus Dehmelt; *UVa, Stony Brook, JLab, MIT, CIAE (China), USTC (China)*

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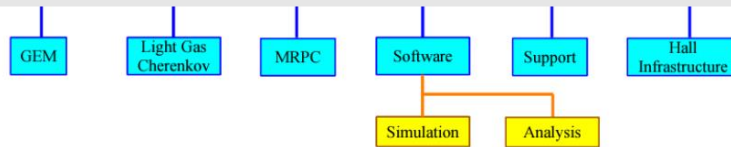


## SoLID Contacts



Hayan Gao - hayan.gao@duke.edu

Zein-Eddine Meziani - zmeziani@anl.gov

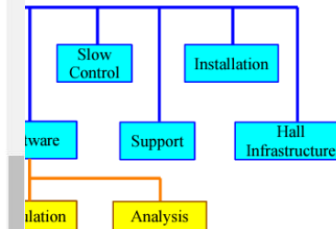


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- **GEM:** Nilanga Liyanage and Klaus Dehmelt; *UVa, Stony Brook, JLab, MIT, CIAE (China), USTC (China)*
- **Calorimeter:** Xiaochao Zheng and Cunfeng Feng; *UVa, Shandong (China), Tsinghua (China), Argonne*
- **Light Gas Cherenkov:** Zein-Eddine Meziani, Nikos Sparveris, Michael Paolone and Simona Malace; *Argonne, New Mexico State, Temple, JLab, Stony Brook*
- **Heavy Gas Cherenkov:** Haiyan Gao, Zhiwen Zhao and Garth Huber; *Duke, Regina (Canada), Stony Brook*
- **MRPC:** Yi Wang and Sanghwa Park; *Tsinghua (China), USTC (China), JLab*
- **DAQ/Electronics:** Alexandre Camsonne and Ron Gilman; *JLab, Rutgers*
- **Simulation:** Zhiwen Zhao and Ye Tian; *Duke, Syracuse, Argonne, UVa*
- **Reconstruction and Analysis:** Chao Peng, Ole Hansen and Weizhi Xiong; *Argonne, JLab, Shandong (China), UVa*
- **Slow Control:** Chandan Ghosh; *JLab*
- **Supporting Structure and Baffle:** Whit Seay and Paul Reimer; *JLab, Argonne*
- **Hall Infrastructure Modification:** Whit Seay and Lawrence Hurt; *JLab*
- **Installation:** Lawrence Hurt and Whit Seay; *JLab, all user groups.*

ive Board

cal Board



Stony Brook, JLab, MIT, CIAE (China),



# Documentation

- Wiki needs to be updated
- SoLID DocDB needs to be updated

Kdehmelt Talk Preferences Watchlist Contributions Log out

Main page Discussion

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## Main Page

**Contents** [hide]

- 1 Experiment
- 2 Preliminary Conceptual Design Report
- 3 Important Documentations and Talks
- 4 Review
- 5 Collaboration Meeting
- 6 Regular Meeting
- 7 Software
- 8 Study
- 9 Design (overall)
  - 9.1 SoLID Setup plot
  - 9.2 Detector Dimension and Layout
  - 9.3 Detectors Channel count and parameters
  - 9.4 Engineering Integration and CAD
- 10 Design (subsystems)
- 11 Info
  - 11.1 Email list
  - 11.2 SoLID webpage
  - 11.3 SoLID DocDB
  - 11.4 SoLID ELog
  - 11.5 File sharing

### Experiment

SoLID (Solenoidal Large Intensity Device) will be used in Hall A 12 GeV era. The approved experiments and their allocated beam time are the following:

- PVDIS(E12-10-007)
  - Submission at PAC 34, Update at PAC 35, Update at PAC 37, Jeopardy update at PAC50 requested 180 days deuterium target, 90 days hydrogen target, plus commissioning, total 338 days;

# Documentation

- Wiki needs to be updated
- SoLID DocDB needs to be updated

The screenshot shows the SoLID Document Database website. At the top right, there is a user profile for 'Kdehmelt' with links for 'Talk', 'Preferences', 'Watchlist', 'Contributions', and 'Log out'. Below this is a navigation bar with 'Main page' and 'Discussion' tabs, and a search box. The main content area features the SoLID logo and the text 'Main Page' and 'Contents [hide]'. Below this, it says '1 Experiment' and 'SoLID Document Database' with a stylized logo. There are links for '[SoLID Home Page]', '[Hall A Home Page]', and '[Private DocDB]'. On the left side, there is a sidebar with 'Instructions', 'DocDB Statistics', and 'About DocDB'. Below this is a search section with a search box and options to 'Show SoLID-doc-#' and 'Show documents modified in the last 20 days'. A 'Calendar of events or today's events' section is also present. At the bottom, there is a 'List:' section with links for 'Authors', 'All documents', 'Topics', 'Groups', 'Keywords', and 'Events'. The footer contains version information: 'DocDB Version 8.8.6, contact Stephen Wood' and 'Execution time: 0 wallclock secs ( 0.06 usr + 0.02 sys = 0.08 CPU)'. There are also links for '[ DocDB Home ]', '[ Search ]', '[ Last 20 Days ]', '[ List Authors ]', '[ List Topics ]', '[ List Events ]', and '[ Logout ]'. On the right side, there is a partially visible text block starting with 'owing:' and '0 days hydrogen target, plus commissioning, total 338 days;'. The Jefferson Lab logo is in the bottom right corner.

# Website and Documentation

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- Website being worked on
- Documentation being updated

Work in progress



# Website and Documentation

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- Website being worked on
- Documentation being updated

Work in progress – please be patient