

# Center for Polymers in Hydraulic Structures (CPHyS)

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## *Geosynthetic Institute*

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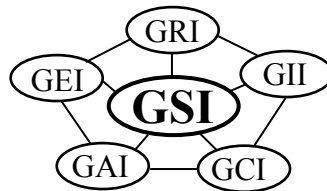


UNIVERSITY

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## **ANNOUNCEMENT**

**The Geosynthetic Institute is proud to announce the formation of a new center within its various existing activities. The Center for Polymers in Hydraulic Structures, aka CPHyS, will focus on hydraulic containment of the following:**

- (i) new and remediated masonry, concrete, earth and earth/rock dams**
- (ii) new and remediated canal lining systems**
- (iii) new and remediated reservoir liners and floating covers**
- (iv) new and remediated tunnel linings in rock or soil**
- (v) new and remediated pipelines of all types and sizes**

**CPHyS will function under the guidance and direction of Dr. Grace Hsuan (with activities at Drexel University), Dr. Jorge Zornberg (with activities at the University of Texas at Austin) and Dr. George Koerner (with activities at the Geosynthetic Institute). Dr. Bob Koerner will serve in an advisory role. The mission, goals, and initial tasks of CPHyS follow.**

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## **Mission Statement**

The Center for Polymers in Hydraulic Structures (CPHyS) is a center within the Geosynthetic Institute (GSI) which focuses on the proper use, design, testing, installation and monitoring of geosynthetics and related materials in hydraulic structures, such as dams, canals, reservoirs, tunnels and pipelines.

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## **Goals and Objectives**

The goals of CPHyS in implementing our mission statement are to perform and facilitate research and development on geosynthetics and related materials for dams, canals, reservoirs, tunnels and pipelines. Primary focus is on liquid containment in hydraulic structures. These applications of hydraulic engineering are among the most challenging and yet beneficial structures that are known to mankind, yet must be accomplished so as to maximize benefit and longevity while minimizing cost and maintenance. Hydraulic systems constitute probably the segment of the geosynthetics market with the largest growth opportunities. The objectives of the center include, but are not limited to, the following:

1. Conducting research on geomembranes and geosynthetic clay liners, as well as on related geosynthetics; such as drainage geocomposites, geotextiles, geogrids and polymer pipe for use in hydraulic structures.
2. Conducting research on related materials such as masonry, concrete, soil, rock, and associated materials as they influence and impact the associated geosynthetic materials.
3. Develop and promote manufacturing specifications and construction installation guides for the relevant geosynthetics and related materials.
4. Develop and/or adopt methodologies for design and analysis of the various applications being addressed.
5. Add to the existing database of geosynthetic and related materials information and, where appropriate, generate new categories for such information that is developed over time.
6. Provide training and tutorial services to member organizations and project sponsors as well as their associates and employees.
7. Develop and provide courses, conferences, symposia, workshops and training courses on the information database as it is being generated.
8. Develop E-learning venues whenever possible for electronic dissemination of the generated information.
9. Provide forensic services on both field successes and failures for geosynthetics used in hydraulic structures.
10. Develop a library of case histories in the relevant categories of dams, canals, reservoirs, tunnels and pipelines as to long-term performance of individual components and the system as a whole.

## **Topics Being Considered**

1. Lifetime of exposed and covered geomembranes of all types that are potentially used in hydraulic structures.
2. Stresses in exposed geomembranes induced by wind uplift, downward or lateral pressures, thermal expansion and contraction, and self-weight.
3. Developing engineering design methods for highly stressed regions of geomembranes used in hydraulic structures of all types.
4. Wind tunnel and/or wave tank design for exposed geomembranes particularly for floating covers of reservoirs and exposed channel linings.
5. Use of GCLs and drainage systems in association with geomembrane liners for hydraulic structures.
6. Design and analysis of buried pipes subjected to differential settlements, heaving due to expansive soils, and bridging of voids.
7. Evaluation of leakage mechanisms for geomembranes and composite liners subjected to high liquid heads.
8. Design criteria and analysis methods for canals involving geomembranes, composite liners, and other geosynthetics.
9. Investigation and durability of various types of repair method to punctured, torn or damaged geomembranes of all types.
10. Developing benefit/cost procedures of comparing geosynthetic waterproofing to other remediation schemes.

## **Commentary**

Please don't hesitate to contact any of us regarding this new venture for GSI. We are all excited about its implementation and look forward to its results within the forthcoming year and for many years in the future.