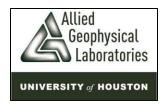
# The Allied Geophysical Lab (AGL) Vision

# Our goal is to do excellent applied geophysical research!



We are dedicated to making significant advances in the understanding and imaging of the subsurface. Specifically, we will work with the resource industry and professional societies to create novel ways to discover and conscientiously recover resources while educating the next generation of geoscientists.

# **Scope of Work**

Making a more accurate and higher resolution image of the subsurface and its resources is always a primary task of applied geophysics. Estimating lithologies and associated petrophysical properties is, in turn, essential. Determining the saturation state of a reservoir and its change has become critical. There remain many grand challenges in applied geophysics: At AGL, we emphasize the physics behind making geologic images of the subsurface. This involves three main categories: Acquisition, analysis, and interpretation of largely seismic data. A key component of our effort is to make geophysical measurements in the laboratory, computer, and field. We have one of the few physical/robotic modeling facilities in the world dedicated to making scaled surveys of structures of energy interest. In addition, we write and employ a number of numerical modeling and analysis codes. Furthermore, we have an excellent capability to acquire near-surface geophysical data (seismic, VSP, well logs, GPS, GPR, and gravity). The University owns a section of land near Galveston that we are developing as a geophysical test site (the La Marque Geophysical Observatory). In 2013, we drilled and cased two 425 ft wells at La Marque which are now used for borehole geophysical teaching and research. UH also manages a 100-person geoscience field camp near Red Lodge, Montana which we use for the education of students in geophysical field methods.

On the processing and analysis side, we develop algorithms related to the imaging and understanding of geophysical (mostly seismic) data. We also use many of the industry-standard processing codes (Paradigm, Landmark, VISTA, Petrel, Kingdom). Our particular expertise is in multicomponent seismic analysis, seismic attributes, borehole seismic, AVO, quantitative interpretation, attenuation, and anisotropy. We are involved with a number of case histories including resource targets as the Barnett, Bakken, and Marcellus shales. In addition, we have numerous studies relating to VSP and 3D (several 4C) seismic data sets in the Gulf of Mexico.

Along with our six closely associated faculty (Stewart, Thomsen, Han, Chesnokov, Zhou, and Castagna), we have some 70 graduate students and staff attached to our applied geophysics effort. We are enthusiastic about working with our industry partners!

Consortium Proposal: Allied Geophysical Laboratories

Agreement period: June 1, 2013 - May 31, 2014

Company contribution (2013-2014): \$45,000.

Our goals are ambitious and moving forward will require sponsorship for the purchase of equipment, instruments, computers, and software. New personnel are needed to undertake research, maintain and operate equipment, as well as for administrative operations, university reporting, safety compliance, and sponsor communications. An overview of our proposed activities in 2013-2014 is shown below.

### **Activities and Timeline:**

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	June 2013	Oct. 2013	Dec. 2013	May 2014
Equipment	200-ch seismic,	300-ch 3C seismic	Shallow marine	Ocean-bottom
	ultrasonic upgrade,	vibroseis; 120 land	seismic	seismometers
	GPS, microphones	nodes		
Facilities &	VISTA, Petrel,	Transform,	Computer	ProMax
software	Kingdom, Focus,	Landmark	hardware upgrade	
	hardware upgrades	Hampton-Russell		
Personnel	Application	Administrative	Post-doctoral	System/data
	geophysicist	assistant	geophysicist	geophysicist
Physical modeling	3D VSP,	Time-lapse sand	3C structure	3C-3D anisotropy
	fracture/fault		nonlinear	
Field work	Houston/local (salt	Montana (deeper	Houston/local	Gulf of Mexico
	& faults);Haiti;	structure); Texas	(deeper	(shallow tests)
	Louisiana	crater; Utah sand	structures)	·

### **Deliverables and Other Benefits:**

The new AGL aspires to make a significant impact on the science of geophysics and deliver clear benefit and advantage to our sponsors. A list of deliverables and other benefits follows:

- All AGL-sponsored physical modeling data will be available to sponsoring organizations
- All field data acquired by AGL will be available to sponsors
- All AGL-sponsored theses, posters, preprints, expanded abstracts, and technical papers and reports will be provided to sponsors
- Software will be periodically released to sponsors
- Sponsor representatives will be invited to the AGL Annual Spring Meeting summarizing the year's research activities in addition to the Annual Dobrin Geophysics Lecture
- Each sponsor will receive periodic communication about AGL personnel, activities, and research
- Sponsors will have a voice on the AGL Industrial Advisory Board to provide guidance and counsel to the Lab
- Sponsors have the opportunity to become familiar with students (prospective staff) and their work

## **Budget Overview: 2013-2014**

Through 2013-2014, we intend to purchase a substantial amount of geophysical equipment. To date, the University of Houston has provided \$1,500,000 toward this effort to date. We seek further contribution from the industry and various other agencies. Equipment purchases are to upgrade the existing physical modeling facility as well as provide an augmented field acquisition and data processing capability. We have assembled a full industry-standard land (Vibroseis) system and are developing a marine capability. Other supporting equipment includes GPS, well-logging, VSP, CG-5 gravimeter, and GPR instruments.

2013 – 2014 Budget	Expenses	Revenue
Equipment, instruments,	\$410,000	
computers		
Personnel salaries	\$400,000	
Field work, travel, communication	\$115,000	
University, state, federal		
contribution (cash)		\$385,000
Industry sponsorship (cash)		\$540,000
Total	\$925,000	\$925,000

#### Lab instruments

Transducers, A/D converters, controllers, lasers, control & recording, software \$75k

## Field equipment

120 channels of seismic node recorders and 3C geophones \$85k; 96-channels of Geodes \$50k Well Logging tools, cable, winch, and truck \$80k; VSP tools, cable and recorders, and GPS \$45k

#### **Computers**

Hardware, software, and visualization \$75k

#### Personnel

Five graduate students \$150k; Four technical and admin. staff \$250k

#### Field work

Survey travel \$45k

#### Travel

Conferences, meetings, courses \$20k

#### **Communication**

Publication costs, newsletters, seminars, meetings \$50k

### Total 2013-2014 expenses \$925k

We require a number of additional staff to operate and maintain the various computer and measurement systems as well as facilitate research. We anticipate hiring four staff throughout 2013-2014. They would include an application geophysicist, postdoctoral fellow, system and data manager, and an administrative assistant. We seek AGL industrial sponsors from the energy, mining, engineering and related sectors. Annual sponsorship cost is \$45k for 2013-2014. A reduced rate of \$15k is available for smaller enterprises (under \$5 million annual revenue). We anticipate that this support and collaboration will arise primarily from the energy industry. We also offer a limited number of Founding and Sustaining Memberships that allow more direct involvement and impact on the future of AGL and its people. Contact Director Robert Stewart (<a href="mailto:rrstewart@uh.edu">rrstewart@uh.edu</a>) for further information.