Appendix A5

Homestake Interim Laboratory Letters of Interest,
http://www.lbl.gov/nsd/homestake/LOI.html

LOI Database

#	Title	Discipline	Principal Investigator	Lead Institution
1	Time Dependent Deformation	Rock Mechanics	Dr. W.G. Pariseau	Uni. Of Utah
2	Scale Effects In Rock Mechanics	Rock Mechanics	Dr. W.G. Pariseau	Uni. Of Utah
3	Stress & Rock Properties of the Yates member of the Poorman Formation	Rock Mechanics	Dr. W.G. Pariseau	Uni. Of Utah
4	Mine Engineering & Management Related Activities	Mining	Dr. Gautam Pillay	SDSMT
5	DUSEL Education & Conference Center	Education & Outreach	Dr. Larry D. Stetler	SDSMT
6	Determination of Water Levels & Stress Release during Dewatering	Geology	Dr. Larry D. Stetler	SDSMT
7	Search for Neutron-Antineutron Transition at Homestake	Physics	Dr. Yuri Kamyshkov	Uni. Of Tennessee
8	Plan for Near Future of High Energy Neutrino Physics at Homestake	Physics	Dr. Al Mann	Uni. Of Pennsylvania
9	Hard Rock Underground Mine Mapping & Surveying	Geology	Dr. Diane Wolfgram	Montana Tech
10	Partitioning of CO2, H2O, gold and trace metals between synformal and antiformal fold h	Geology	Dr. Diane Wolfgram	Montana Tech
11	Developing an Internet-accessible database of 3D geologic and engineering data	Geology	Maribeth Price	SDSMT
12	Hydrologic Instrumentation of the Homestake DUSEL	Geology	Dr. Arden Davis	SDSMT
13	New Paradigms in Sensing	Engineering	Dr. Steven Glaser	UC Berkeley
14	Effects of Ultralow Radiation Levels on Human Cells	Microbiology	Dr. Betsey Sutherland	BNL
15	Microbial Evolution	Microbiology	Dr. Susan M. Pfiffner	Uni. Of Tennessee
16	Workshops	Education & Outreach	Dr. Susan M. Pfiffner	Uni. Of Tennessee
17	Effects of Cosmic Rays on the Soft Error Rate of Semiconductor Memory Chips at Grour	Engineering	Dr. Li Chen	SDSMT
18	Controls on World-Class Homestake Gold Mineralization	Geology	Dr. Colin Paterson	SDSMT
19	Low Radioactivity Measurement Laboratory	Low Backg. Counting	Dr. Ila Pillalamarri	MIT
20	Role of Iron Formations in the Making of Giant Gold Deposits	Geology	Dr. Nuri Uzunlar	SDSMT
21	Thermal History of Homestake Mine	Geology	Dr. Nuri Uzunlar	SDSMT
22	Super CDMS	Physics	Dr. Dan Akerib	Case Western
23	Determination of Diurnal changes in the rotation rate of the earth	Physics	Dr. Gautam Pillay	SDSMT
24	Establishing the Physical Footprint for Future Geoscience Research at DUSEL	Geology	Dr. Larry D. Stetler	SDSMT
25	Developing of a robotic sampler for underground and confined environments	Engineering	Dr. Gautam Pillay	SDSMT
26	Homestake Electrical Engineering Laboratory (HEEL)	Physics	Dr. Robert McTaggert	SDSU
27	Homestake Outreach Program (HOP)	Education & Outreach	Dr. Matthew Miller	SDSU
28	Bioprospecting	Microbiology	Dr. Bruce Bleakley	SDSU
29	Analysis of soil-like materials in the mine	Geology	Dr. Bruce Bleakley	SDSU
30	Biological effect of low levels of radiation-Health Physics	Microbiology	Dr. Robert McTaggert	SDSU
31	Homestake Neutrinos	Offer to Collaborate	Dr. Robert McTaggert	SDSU
32	Establishing baseline data for microbial populations of the mine before and after dewater	Microbiology	Dr. Bruce Bleakley	SDSU
33	Cloud physics facility and experiments for an underground laboratory	Atmospheric sciences	Dr. John Helsdon	SDSMT
34	Fracture network characterization at Homestake	Rock Mechanics	Dr. Matthew Mauldon	Virginia Tech
35	Risk Assessment of underground space modifications at Homestake	Rock Mechanics	Dr. Matthew Mauldon	Virginia Tech
36	Hydrogeology Collaboration on flow path delineation and modification	Earth Sciences	Dr. Joseph Wang	LBNL
37	Geochemistry collab. for the geochemical evolution of fluids in the Homestake hydrologic	Earth Sciences	Dr. Joseph Wang	LBNL
38	Ecology/geomicrobiology collaboration for microbe evolution	Earth Sciences	Dr. Joseph Wang	LBNL
39	Geophysics collaboration for imaging	Earth Sciences	Dr. Joseph Wang	LBNL
40	Rock Mechanics and geoengineering collaboration for excavation research	Earth Sciences	Dr. Joseph Wang	LBNL
41	Couple process collaboration for large block experiments	Earth Sciences	Dr. Joseph Wang	LBNL
42	Cosmic ray studies	Earth Sciences	Dr. Joseph Wang	LBNL
43	Characterization and mechanics of faulting and rock fracture at homestake mine	Rock Mechanics	Dr. Stephen Martel	University of Hawaii
44	Breccia evolution associate with degassing of tertiary veins and dikes at Homestake	Geology	Dr. Alvis Lisenbee	SDSMT
45	Development of a 3D geological model of the Homestake mine area	Geology	Dr. Dean Peterson	Uni. Of Minnesota
46	Detailed geological mapping of the Homestake mine area	Geology	Dr. Dean Peterson	Uni. Of Minnesota
47	Close range remote sensing for mapping of rock in underground excavations	Geology	Dr. Joseph Dove	Virginia Tech
48	ZEPLIN - a multi ton scale liquid xenon dark matter direct search program	Physics	Dr. Hanguo Wang	UCLA

LOI Database

#	Title	Discipline	Principal Investigator	Lead Institution
49	EXO - the enriched xenon observatory for neutrino-less double-beta decay	Physics	Dr. Giorgio Gratta	Stanford
50	Educational outreach support infrastructure	Education & Outreach	Dr. Omar El-Gayar	Dakota State Univ.
51	Low-alpha lead and the cosmic-ray equivalency factor	Physics	Dr. Glenn I. Lykken	Uni. Of North Dakota
52	Study of a LANNDD of 100kTon at Homestake DUSEL	Physics	Dr. David B. Cline	UCLA
53	Investigation of microbial diversity in subsurface ecosystems	Microbiology	Dr. Sookie S. Bang	SDSMT
54	Initial low background counting facilities for Homestake	Physics	Dr. Kevin Lesko	LBNL
55	Large block (Pillar) test to study the failure of rock - rock strength and earthquake mecha	Rock Mechanics	Dr. Derek Elsworth	Penn State
56	Mini-CLEAN	Physics	Dr. Daniel N. McKinsey	Yale
57	Understanding the complxities of long term data storage in space exploration	Data storage	Dr. William Figg	Dakota State Univ.
58	R&D and physics with a 9m3 gaseous time projection chamber	Physics	Dr. Giovanni Bonvicini	Wayne State Uni
59	XENON100/1000	Physics	Dr. Richard Gaitskell	Brown University
60	Long term seismic and seismologic monitoring of stress and fluid dynamics in the upper (	Earth Sciences	Dr. Serge A. Shapiro	Freie Universitaet Berlin
61	The Majorana Neutrinoless Double Beta-Decay Experiment	Physics	Dr. John Wilkerson	Univ. of Washington
62	Deep fracture mapping at DUSEL using acounstic techniques	Geology	Dr. Gautam Pillay	SDSMT
63	Directional recoil identification from Tracks (Drift)	Physics	Dr. Dan Snowden-Ifft	Occidental College
64	High-current ion accelerator	Physics	Dr. Paul Vetter	LBNL
65	Coupled mechanical-hydrological behavior of fractured rock mass	Geology	Dr. Herb Wang	Uni. Of Wisconsin
66	Center for risk, the community and the environment	Education & Outreach	Dr. Peter Young	The RedWater Group
67	Rock bolt research, backfill testing, large diameter excavation research	Rock Mechanics	Dr. R.L. McNearny	Montana Tech
68	Crustal assimilation of volatile evolution in rhyolite and phonolite dikes	Geology	Dr. Genet Duke	Dr Genet Duke Collaboration
69	Low energy neutrino spectrometer	Physics	Dr. Raju Raghavan	Virginia Tech
70	Microbiological cultivation, community metagnomics, nanogeoscience, and stable isotope	Microbiology	Dr. Eric Roden	Uni. Of Wisconsin
71	A Geoneutrino experiment at Homestake	Physics	Dr. Nikolai Tolich	LBNL
72	SIGN - A high-pressure, gaseous-neon-based Dark Matter Detector	Physics	Dr. James T. White	Texas A & M
73	A longitudinal study of the health of homestke lab personnel exposed to the 4850 enviror	Medicine	Dr. Jeffrey A Henderson	BH Center Amer. Indian Health
74	Surface facility planning and design for the Homestake Mine	Education & Outreach	Dr. Jennifer Karlin	SDSMT
75	Impact of subsurface microbial activity on the physical and chemical propeties of geologi	Microbiology	Dr. T. C. Onstott	Princeton University
76	Large scale vs. small scale tranport of microorganisms and multi-phase CHO fluids	Microbiology	Dr. T. C. Onstott	Princeton University
77	Impact of subsurface microbial activity on the corrosion and deterioration of metallic infra	Microbiology	Dr. T. C. Onstott	Princeton University
78	Deep Coupled Process Laboratory	Microbiology	Dr. Tommy Phelps	ORNL
79	Ecosystem biochemistry transistioning from Near-Surface to Deep Earth Ecosystems	Microbiology	Dr. Tommy Phelps	ORNL
80	Limits of life in the biosphere	Microbiology	Dr. Tom Kieft	New Mexico Tech
81	Evolution of Autotrophy	Microbiology	Dr. Bruce Bleakley	SDSU
82	General Interest	Various	Dr. Harry Miley	PNL
83	Earth sciences experiments in the Homestake mine: studies focused on geologic CO2 st	Earth Sciences	Dr. Curt Oldenburg	LBNL
84	Precambrian Research Center	Geology	Dr. Dean Peterson	Minnesota
85	LIGO - preliminary inquiry	Gravity Wave	Dr. Jay Marx	CalTech
86	Liquid Argon Detectors - preliminary inquiry	Physics	Dr. Bonnie Fleming	Yale
87	Threshold Dark Matter preliminary inquiry	Physics	Dr. Juan Colar	U. Chicago
88	Post-glacial warming in northern high latitude regions	Geology	Dr. Will Gosnold	University of North Dakota

MOUs

Date	MOU #	Between SDSTA and	Project	Start Date	Duration
9/25/06	06-01	University of California Berkeley; University of Washington; Lawrence Berkeley National Laboratory; Los Alamos National Laboratory; University of South Dakota; South Dakota State University; Augustana College; South Dakota School of Mines & Technology	Underground Low Background Counting Facility	late-2008	Life of Lab
9/26/06	06-02	University of California Berkeley; Lawrence Berkeley National Laboratory; South Dakota School of Mines & Technology	Homestake Seismic Array	9/2/11	3 years
11/15/06	06-03	Black Hills State University	Development of a science education program to be associated with the Sanford Center for Science Education	1/2/11	6 months

Letters sent in anticipation of MOU development

Date	Collaboration	Project
9/28/06	Dr. Andrew Hime, Los Alamos National Laboratory; Dr. Edward Kearns, Boston University; Dr. Daniel McKinsey, Yale University	MiniCLEAN, LOI #56
9/28/06	Dr. Raju Raghavan, Virginia Polytechnic Institute	LENS, LOI #69
10/30/06	Professor Elena Aprile, Columbia University	XENON, LOI #59
10/30/06	Dr. Richard J. Gaitskell, Brown University; Dr. Tom Shutt, Case Western Reserve University	LUX, LOI #59
11/20/06	Professor John Wilkerson, University of Washington	Majorana, LOI #61