

# **Science-Technology-Mathematics**

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**activities, competitions, and  
recognition: regional, state,  
national, and international**

A report commissioned by the State of Utah  
Department of Business and Economic Development  
July 2004-June 2005



Prepared by  
The Utah Science Center  
243 East 400 South Suite 302  
Salt Lake City, UT 84111  
[www.utahsciencecenter.org](http://www.utahsciencecenter.org)

with research and input provided by  
Pathway Associates, LLC  
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# Executive Summary

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## Background

This report is the deliverable for DBED Utah Grant 051931 for the Utah Science Center to prepare a report on:

- managing and evaluating the Salt Lake Valley Science and Engineering Fair (SLVSEF)\*;
- the possibility of creating and managing a State Science Recognition Event; and
- developing guidelines for hosting a future Intel International Science and Engineering Fair (ISEF) in Salt Lake City.

The report was compiled primarily by direct interaction with individuals involved with the Salt Lake Valley Science and Engineering Fair as well as interviews related to State-wide Recognition Events and the Intel International Science and Engineering Fair. The interviews and related research were conducted by Pathway Associates, LLC.

## Recommendations

### Utah Regional Science Fairs

- All Utah regional science fairs should be scheduled on the same day. Boundaries should be established by a coordinating committee consulting of the Directors of each of the regional fairs. This has largely been accomplished, as a result, in part, of the interviews and activities involved with this study.
- The four Utah regional ISEF-affiliated fairs should coordinate, cooperate, and jointly participate in state-wide and regional recognition events. Such coordination is now well underway. The four fair directors/managers have met, geography/area issues are much better understood and coordinated, and joint publicity and communication efforts are underway.
- Utah technology-based companies should be involved (as mentors, judges, etc.) and provide sponsorship of their particular regional fairs. SLVSEF is initiating such involvement among companies in its geographic regions.
- The Utah State Office of Education (USOE) and the Utah District Science Curriculum Coordinators should be informed as to their regional fair and encourage their district teachers and students to participate. This is now in place.

\*A complete list of abbreviations is in Appendix A

- The State of Utah Department of Business and Economic Development (DBED), the funder of this study, should provide some sponsorship and support of Utah regional fairs, including perhaps special prizes or awards, which could be tied to the State's new economic development clusters programs. ([www.goed.utah.gov](http://www.goed.utah.gov))

## Statewide Recognition Event (SWRE)

- Utah should proceed with developing a Statewide Recognition Event (SWRE).
- We recommend the event be considered parallel and complementary to the Governor's Medal for Science and Technology.
- A SWRE planning committee should be appointed charged with developing a time line, budget, and process. We recommend the SWRE Planning Committee consist of:
  - Governor's Education Advisor
  - Governor's Science Advisor
  - Director, Utah Science Center
  - Science Curriculum Supervisor, USOE
  - Current Chair, Governor's Medal Committee
  - Current Chair, State Science Advisory Council.
- We further recommend that \$15,000 be made available with which to plan, launch, and conduct the state's first SWRE in April 2006 (after the regional science fairs and before the Intel ISEF).
- A mechanism must be established to receive, categorize, summarize and archive the appropriate data and information from throughout the state – perhaps implemented and coordinated by USOE, the Utah Science Center (USC), and the Governor's Education and Science Advisor offices.

## National and International Events

- We recommend that the State Science Advisor work with the Travel Council and Salt Lake Visitors and Convention Bureau to establish and organize a process for recruiting Intel ISEF 2011 to Salt Lake City, Utah.
- An initial budget of \$25,000 be made available to the organizing committee for planning and solicitation of the 2011 bid. The bid must be presented to ISEF at its May, 2006 meeting.
- A State commitment of \$200,000 for FY 2011 will be needed for the actual conduct and operation of ISEF 2011 if the venue is awarded to Utah.

# I. Background

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This report is the deliverable for DBED Utah Grant 051931 to the Utah Science Center to prepare a report on:

- managing and evaluating the Salt Lake Valley Science and Engineering Fair (SLVSEF);
- the possibility of creating and managing a Statewide Recognition Event (SWRE); and
- developing guidelines for hosting a future Intel International Science and Engineering Fair (ISEF) in Salt Lake City.

The report was compiled primarily by direct interaction with individuals involved with the Salt Lake Valley Science and Engineering Fair as well as interviews related to SWREs and the Intel International Science and Engineering Fair. The interviews and related research were conducted by Pathway Associates, LLC:

## II. Utah regional science fairs

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### A. Why science fairs?

Science fair participation is an ideal way for students to gain experience in both the scientific method and individual research. Participating in science fairs allows students to interact with and learn from advisors, mentors, judges and other student participants.

A science fair project can be self-validating and exciting as it involves real discovery of little known or even unknown information. Science fair projects often result in cash prizes and can help open the doors to academic opportunities. Participating in science fairs can also lead to more successful college applications, better job opportunities, and other rewards, as well as providing motivation and background for future study. Most regional high school level science fairs are affiliated with the Intel International Science and Engineering Fair (ISEF).

Winners of local regional fairs are eligible to move on participate in the annual Intel ISEF each May, where they compete for over \$2 million in scholarships, tuition grants, scientific equipment, internships and trips. Participants' projects are worthy of international competition and are judged by scientists representing many states and countries. The exposure and self confidence such an opportunity generates cannot be quantified.

Perhaps most importantly, however, graduating high school students with records of awards for original research or engineering at the regional fair and beyond have a distinct advantage over other college applicants in being considered and accepted by the schools of their choice. This is because science fair honors rank high among the screening factors used by admissions officers at most top universities.

### B. Utah regional fairs

The state of Utah holds four regional, ISEF affiliated fairs each year:

- Salt Lake Valley Science and Engineering Fair (SLVSEF)
- Central Utah Science and Engineering Fair (CUSEF)
- Southern Utah Science and Engineering Fair (SUSEF)
- Harold W. and Helen M. Ritchey State Science and Engineering Fair of Utah (HHRSEF)

Each of the affiliated fairs is associated with a local University with varied numbers of participating school districts, as outlined in Table 1 below.

Each of the four Utah fairs operates independently and is responsible for their own fundraising. The Central Utah Science and Engineering Fair (CUSEF) has a partnership with the David O. McKay School of Education at Brigham Young University (BYU) and the five school districts who participate in their fair. BYU and each of the five school districts pay into the partnership. The funds are allocated by the governing board to several different educational activities, including the science fair. CUSEF employs one full time

fair manager and four part time assistants whereas the other three fairs are run mostly by volunteers.

Students from CUSEF won six awards at ISEF in May 2005, including the Ricoh Sustainability award – a \$50,000 scholarship and trip to the 2005 World Exposition in Aichi, Japan for the winning team project. SLVSEF had one winner, SUSEF had three winners and HHRSEF had one winner.

Although the Intel ISEF fair is limited to high school students, most regional fairs also have an elementary and junior high division. Winners in grades 5-8 in these divisions of the fair are eligible to enter the Discover Channel Young Scientist Challenge. (<http://school.discovery.com/sciencefaircentral/dysc>). 13 semi-finalists from Utah Regional Fairs were announced in late August. Eight were from CUSEF and five from SLVSEF. Only 40 finalists from the US will be chosen to attend an all expense paid trip to Washington DC to participate in the final Young Scientist Challenge. Two finalists, one from CUSEF and one from SLVSEF, were announced in mid-September 2005.

Utah science fairs foster University/community cooperation by developing the scientific and communication skills of tomorrow's leaders while publicly recognizing the achievements of Utah's talented students. By promoting Utah students' interest in science, mathematics, and engineering, Utah's regional science fairs encourage our bright young students to continue their education in their home state by awarding local scholarships and tuition grants.

Utah science fairs also recognize science teachers for their outstanding dedication and commitment to teaching and have identified a large number of individuals representing various organizations willing to participate as volunteers and project judges in regional state fairs.

### **C. Salt Lake Valley Science and Engineering Fair (SLVSEF)**

After a lapse of many years the Salt Lake Valley Science and Engineering Fair (SLVSEF) was reinstated by the Utah Engineering Experiment Station (UEES), University of Utah, in 2001 and was organized and run by UEES through 2004. It was transferred to the Utah Science Center (USC) in spring 2005 and has been administered by the USC since then.

The 2005 SLVSEF was managed by the Utah Science Center (USC) and hosted by the University of Utah. SLVSEF was open to elementary, middle and high schools students in 5<sup>th</sup> through 12<sup>th</sup> grade. The USC is a partner in The Leonardo at Library Square in Salt Lake City and is linked to the Utah scientific, technical, and business communities, as well as to the University of Utah.

Fair activities included student check-in and project set-up. A box luncheon meeting was held the day before the fair for the volunteer judges to review the protocol and procedures for evaluating each of the projects entered by the students. The public was invited to view the students' research projects with the event wrapping up with the awards ceremony attended by approximately 300 students, family members, news media, and the general public. Photos and additional information for the 2005 science fair

can be found on the SLVSEF website at <http://www.utahsciencecenter.org/sciencefair>.

SLVSEF 2005 was held on the 6<sup>th</sup> floor of The Tower at Rice-Eccles Stadium, University of Utah March 17-18, 2005. 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place medals were awarded in each of the 14 ISEF categories (see Appendix B) for the Fair's junior and senior divisions as well as additional special award certificates and prizes. Special awards presented to winning students must meet precise criteria specified by the organization or sponsor giving the award. Example criteria are use of photography, environmental requirements, or specific health benefits.

Five students were selected as grand award winners to represent SLVSEF at the Intel International Science and Engineering Fair (ISEF) in Phoenix, Arizona May 8-14, 2005. Each student was awarded an all expense paid trip to attend the Intel ISEF. These awards were given in recognition of their research project initiatives, and to also recognize their outstanding dedication and commitment to investigative research.

Judges for SLVSEF included 115 individuals from the University of Utah (undergraduate students, graduate students, faculty, and staff) and local business representatives. These judges evaluated 164 science and engineering projects. While this is a 40 % increase over the previous 2004 SLVSEF, CUSEF has even greater participation, serving up to 600 students.

The Utah Science Center (USC) will work more closely with school district science advisors in promoting SLVSEF 2006 to encourage more students to become involved in the Fair. The planning committee is already working to plan next year's event, including the need for mentors who would be available to work with students. These changes should nearly double the registration for the SLVSEF 2006.

The primary sponsors of SLVSEF are the University of Utah, Intel Foundation and the Utah Science Center. SLVSEF has the support of the University of Utah administration, undergraduate and graduate students, and faculty. Public and private school science

TABLE 1 – Utah  
Regional ISEF Affiliated  
Science Fairs

<b>UTAH REGIONAL FAIR</b>	<b>Salt Lake Valley Science and Engineering Fair (SLVSEF)</b>	<b>Central Utah Science and Engineering Fair (CUSEF)</b>	<b>Southern Utah Science and Engineering Fair (SUSEF)</b>	<b>Harold and Helen Ritchey Science and Engineering Fair (HHRSEF)</b>
PARTICIPATING UNIVERSITY	University of Utah	Brigham Young University	Southern Utah University	Weber State University
ANNUAL BUDGET	\$45,000	Est. \$65,000	Not available	Not available
NUMBER OF PARTICIPANTS	165	600	Not available	Not available
PARTICIPATING SCHOOL DISTRICTS	4	5	20	11
FAIR DIRECTOR/ MANAGER	Pete Doenges Jody Ostrander	John Gardner Lisa Clarke	Barbara Rodriguez	Dawn Gatherum
CONTACT INFO	(801) 463-0464	(801) 422-1987	(435) 586-7900	(801) 626-6175

teachers also helped promote the Fair, including the Science Specialist of the Utah State Office of Education, and the Salt Lake City School District.

## **D. Recommendations**

- All Utah regional science fairs should be scheduled on the same day. Boundaries should be established by a coordinating committee consulting of the Directors of each of the regional fairs. This has largely been accomplished, (Figure 1) as a result, in part, by the interviews and activities involved with this study.
- Regional fair representatives should attend the USOE (Utah State Office of Education) Fall District Science Coordinators meeting to announce their fairs/dates. Science Fair Directors and USOE Science curriculum specialists should work closely in clarifying and encouraging on going fair participation.
- The four Utah regional ISEF-affiliated fairs should coordinate, cooperate, and jointly participate in state-wide and regional recognition events (see next section). Such coordination is now well underway. The four fair directors/managers have met, geography/area issues are much better understood and coordinated (Figure 1) and joint publicity and communication efforts are underway.
- Utah technology-based companies should be involved (as mentors, judges, etc.) and provide sponsorship of their particular regional fairs. SLVSEF is initiating such involvement among firms within its geographic regions. (Figure 1)
- The Utah State Office of Education (USOE) and the Utah District Science Curriculum Coordinators (Appendix D) should be informed as to their regional fair and encourage their district teachers and students to participate.
- The State of Utah Department of Business and Economic Development (DBED), the funder of this study, should provide some sponsorship and support Utah regional fairs, including perhaps special prizes or awards, which could be tied to the State's new economic development clusters programs. ([www.goed.utah.gov](http://www.goed.utah.gov))

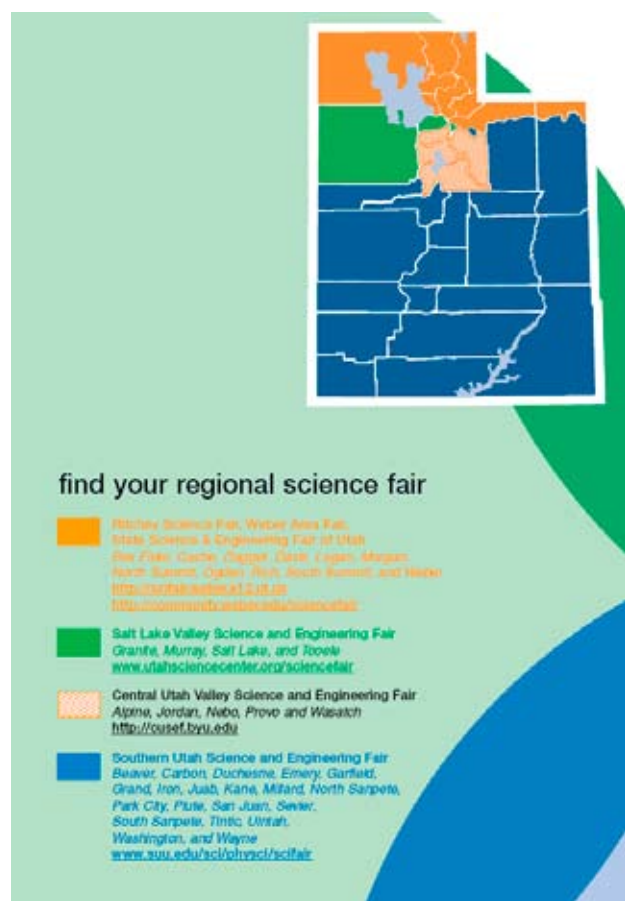
### III. Statewide recognition event

#### A. Background

A State-Wide Recognition Event (SWRE) would recognize and celebrate the accomplishments of high school students in Utah in all major categories of education. This report addresses only science, mathematics, technology and related areas. Students from across the State would be identified and invited to attend the SWRE, based on their individual accomplishments at local related events and competitions, particularly, the Intel ISEF-affiliated regional fairs. Attendees would be recognized for their accomplishments in individual fields in a non-competitive environment of presentation and mutual interaction.

In considering the development of a SWRE it was important to receive input from all perspectives, including political, educational, private sector and prospective sponsors to determine relevant considerations and evaluate the level of interest and support for SWRE. Numerous individuals were therefore contacted and interviewed. The issues discussed included:

Figure 1: Utah Regional Fairs and Participating School Districts



- Awareness of related events in their state (e.g. science fairs, science olympiads, mathematics competitions, etc.),
- Awareness of related national/international events,
- Considerations of manpower, finances, prizes/awards etc. for a possible SWRE; and
- Any other related perspectives or considerations expressed by the interviewee.

Table 2 lists the individuals interviewed for this study. *Quotations derived from the interviews are used throughout this report in italics.* The interviews were conducted primarily by Jayceen Craven-Walker of Pathway Associates, LLC.

#### B. What do other states do for a statewide recognition event?

Most states have Science Fairs and Olympiads but no one interviewed was aware of any state with a Statewide Recognition Event for students of all disciplines. Several of those interviewed expressed an interest in following up with Utah to determine the success of this type of event. If Utah were to pursue an event of this type it would serve as a model for other states to follow.

Fort Wayne, Indiana has a Science Fair Recognition Day. An event similar to Indiana's, but expanded to include all disciplines, is envisioned for the state of Utah.

*"Each area science fair awards their state level competitors and then two others as runner ups or special recognition. The groups are then hosted at Science Central, Indiana's Center for Science, Mathematics and Technology, on a Sunday for a couple of hours. They are presented with a certificate and coupons for items in their gift store. The event has grown tremendously over the years and, as of yet, they haven't had to turn a school away. This event is a nice option for those projects/student the teachers want to get recognition for their hard work."*

### **C. What does Utah currently do?**

Utah has four regional Science Fairs, Science Olympiads, and other competitions. (Table 3) Utah is strong in science fairs as well as several knowledge based competitions which will facilitate the process of selection for a SWRE. A full listing of Utah Competitions as well as national competitions, type of competition, who is eligible, prizes, location, websites and any other notes (such as Utah winners) is included as Appendix E.

There is strong support for a Statewide Recognition Event (SWRE). The event should not be a competition but a celebration of excellence for academic students in the state.

Several of the persons interviewed expressed a strong desire to see academic students recognized as much if not more so than athletic students for outstanding accomplishments. One individual summed up these feelings:

*"There is so much emphasis on athletics but how many students continue on a professional level? More students go on to further their education. Many people would like to see scholastics recognized before athletics."*

A strong ongoing SWRE would have numerous and far-reaching impacts on the State of Utah in motivating and promoting educational goals at the local and state level.

A SWRE would motivate students and teachers to emphasize scientific innovation and to develop original projects worthy of recognition and award potential. A prestigious and well-supported recognition and reward program and event would give students predisposed to science and technology a platform for advanced original work and may motivate less scientifically inclined students to consider scientific studies beyond the standard curriculum.

The University of Utah and other institutions of higher education in the state have a key interest in identifying students with advanced skills and interest in science and technology. In finding and recognizing the best students in the State it would be possible for Utah colleges and universities to recruit the best local students and keep them in Utah as their education advances to the next levels. Promoting scientific education and then keeping the best in Utah insures that the investments made in early education will have ongoing benefits to future education and business development for the entire state.

There are many events to celebrate and reward teachers but only local and regional events that celebrate students. Following this event the students could be called “Utah’s Ambassadors for Science”, Math, Technology or whatever their field may be.

## **D. What might a Utah statewide recognition event include?**

Many of those interviewed indicated that it will take something significant to get students to attend a Statewide Recognition Event since

*“These are the same students who are also involved in AP classes and end of year AP testing and they are very busy.”*

It was suggested that the students receive certificates signed by the Governor or plaques with the state seal. It may be possible to have medallions made that would say “Utah’s Ambassador” or “Utah’s Ambassador for Science (or whatever field for which they are being recognized)”.

Since many of these students end up going out of state to further their education

*“It would be a significant draw to offer these students’ scholarships to any in state institution of higher learning.”*

Although many such students would receive scholarships based on their academic performance, recognition of project-based inventive and creative skills is often lacking. More ‘hands on’, perhaps less academically inclined, students would be especially benefited by a SWRE. This would be one way to keep the pipeline full of science and technology students to be recruited by high technology businesses in Utah. A working cooperation between the event and Utah’s Universities and Colleges would be instrumental to further the advantages to both students and institutes in keeping top-level students in Utah.

It is important to have at least one significant speaker give the keynote or main speech to the students. It was suggested to

*“Have the Governor attend if not be the keynote address for these events.”*

The number of attendees would grow yearly if this event goes forward and continues to grow. An estimated number for the first year would be 500 students, parents and teachers.

Potential venues may vary as the event grows and develops. It is advisable that the event travel around the state. It is suggested that,

*“Every other year the event be held on the Wasatch Front”.*

Detailed coordination would need to occur between the organizing body and the local venues. Numerous venues may be considered for this recognition event. Cooperation and organization between regions would obviously facilitate this process. One

Table 2: People Interviewed for this Report

<b>Name</b>	<b>Title</b>
Brett Moulding	State Curriculum Coordinator, USOE
Ken O'Brien	Science Coordinator, USOE
Jerry Evans	Mathematics Coordinator, USOE
Nicole Paulson	Mathematics assistant, USOE
Michael Keene	former State Science Advisor
Suzanne Winters	former State Science Advisor
Ray Beckett, Jr.,	Utah Engineering Experiment Station
Holly Jordan	committee member on Huntsman Excellence in Education awards
Larry Madden	President, Utah Science Teachers Association, Science Coordinator, SLC School District
Sharon Ohlhurst	Coordinator, Science Olympiad, WSU
Dawn Gatherum	Fair Director, Ritchey Science and Engineering Fair, WSU
Lisa Clarke	Coordinator, Central Utah Science and Engineering Fair, BYU
John Gardner	Fair Director, Central Utah Science and Engineering Fair, BYU
Jody Ostrander	Coordinator, Salt Lake Valley Science and Engineering Fair, U of U
Pete Doenges	Fair Director, Salt Lake Valley Science and Engineering Fair, U of U
Ralph Peterson	President, Idaho Science Teachers Association
Sharla Dowding	President, Wyoming Science Teachers Association
Debra Lynn O'Gorman	President, Nevada Science Teachers Association
Wayne Mangold	President, Montana Science Teachers Association
Jason Bagley	Intel Corporation
Sharon Snyder	International Liaison and Ambassador, Science Service
Eddie Williams	Cleveland organizing committee Intel ISEF 2003
Richard Knight	Portland organizing committee Intel ISEF 2004

Table 3: Other Utah Competitions

<b>COMPETITION</b>	<b>Igniting Creative Energy Challenge</b>	<b>Utah Envirothon</b>	<b>Utah Science Olympiad</b>	<b>Utah State Math Competition</b>
<b>TYPE</b>	Knowledge Based Competition	Knowledge Based Competition	Knowledge Based Competition	Math Test
<b>PARTICIPATING GRADES</b>	K-12	9-12	7-12	7-12
<b>LOCATION</b>	Salt Lake City, UT	Rotates throughout Utah	Weber State University	Weber State University
<b>MANAGER/DIRECTOR</b>	National Energy Foundation	Utah Association of Conservation Districts	Center for Science and Mathematics Education	Weber State University

interviewee suggested

*“Ask for or hire someone from each region to represent their region and participate in the organizing and implementation of the Statewide Recognition Event.”*

A SWRE should be coordinated with the Governor’s statewide education and economic development initiatives.

Many of those interviewed would like to see USOE involved in a SWRE. USOE could be the main repository for information and resources.

*“The USOE has the contacts for all the curriculum components and directly or indirectly are aware of all the competitions and events held throughout the state.”*

## **E. Recommendations**

- Utah should proceed with developing a Statewide Recognition Event (SWRE).
- We recommend the SWRE event be considered parallel and complementary to the Governor’s Medal for Science and Technology.
- A SWRE planning committee, charged with developing a time line, budget, and process. We recommend the SWRE Planning Committee consist of:
  - Governor’s Education Advisor
  - Governor’s Science Advisor
  - Director, Utah Science Center
  - Science Curriculum Supervisor, USOE
  - Current Chair, Governor’s Medal Committee
  - Current Chair, State Science Advisory Council.
- We further recommend that \$15,000 be made available with which to plan, launch, and conduct the state’s first SWRE in April 2005 (after the regional science fairs and before the Intel ISEF).
- A mechanism must be established to receive, categorize, summarize and archive the appropriate data and information from throughout the state – perhaps implemented and coordinated by USOE, the Utah Science Center (USC), and the Governor’s Education and Science Advisor offices.

## IV. National and international science and engineering events

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### A. Overview

There are at least 40 national and/or international events, many of which could be held in Utah. Unfortunately, only one of the 40 events has regular representation from the state of Utah. The state regularly sends local science fair winners to the annual Intel International Science and Engineering Fair (ISEF). These 40 events range in size from a few dozen participating students to over 1,400 participants at Intel ISEF.

Table 4: NATIONAL COMPETITIONS (see Appendix E for more details)

TYPES OF COMPETITION	# OF NATIONAL EVENTS
Problem Solving Competitions	3
Essay Competitions	7
Environmental Awareness Competitions	2
Exam Based Competitions	2
Knowledge Based Competitions	2
Math Competitions	5
Merit Based Scholarship Competitions	1
Photography/Video Competitions	2
Point Based Activity Based Competitions	1
Question and Answer Competitions	2
Research Based Competitions	4
Web Design Competitions	1
Structural Engineering	3
Robotics Engineering	3
Aeronautics Engineering	2

### B. Intel International Science and Engineering Fair (ISEF)

#### 1. Background

A bid from Utah was submitted to host the 2008 Intel ISEF conference. The conference was awarded to Atlanta, Georgia.

There is strong consensus from those interviewed and from attendees at the Intel ISEF 2005 Conference in Phoenix that Utah would be an ideal location for a future Intel ISEF.

*“We have many of the same amenities that other host cities have or had when they were planning their conferences.”*

The Phoenix event in 2005 attracted thousands of visitors (including at least 11 Nobel Prize winners!) as well as the eyes of the scientific world. Utah could enjoy the pride of hosting a world class international event, and in the process generate close to \$5 million for the local economy (according to an Intel ISEF report) by bringing in as many as 4,700 or more visitors to the city during the Intel ISEF week.

The Salt Lake Convention and Visitor’s Bureau has already reserved the first week of May 2011 in support of a bid for ISEF-2011 in Salt Lake City.

## 2. Other host cities

Table 5 summarizes ISEF events from 2000 through 2011.

Table 5: ISEF HISTORY

Year	Location	Students	Total Registration	Contact
2000	Detroit, Michigan	1172	3742	
2001	San Jose, California	1201	4260	
2002	Louisville, Kentucky	1240	4806	
2003	Cleveland, Ohio	1255	4729	Eddie Williams
2004	Portland, Oregon	1393	4281	Dick Knight
2005	Phoenix, Arizona	1420	4460	Philip Huebner
2006	Indianapolis, Indiana	1475 (est)	4625 (est)	Elisa Rice
2007	Albuquerque, NM	1525 (est)	4825 (est)	Russ Fisher Ives
2008	Atlanta, Georgia	1600 (est)	5000 (est)	Phil Dodd
2009	Reno, Nevada	1675 (est)	5225 (est)	Steve Well
2010	San Jose, California	1700 (est)	5425 (est)	Sharon Snyder
2011	Salt Lake City???	1800 (est)	5650 (est)	To be appointed

### ISEF 03—Cleveland:

*“We were very fortunate to have a committee of well-connected supporters. We were also grateful to use the Cleveland Convention Center that could house everything in one location and our largest social event was held at the Rock and Roll Hall of Fame.”*

Eddie Williams was the Chairman of the Cleveland committee and was involved six years prior to the event being held. The Norson Corporation donated Mr. Williams’ time

for the four years he worked on the project. He feels strongly that the success of the conference was because a position like his (Community Relations Manager) was dedicated to the effort. He also coordinated the volunteer program.

**ISEF 04—Portland:** Had two different objectives for their event:

1. That it be a strong positive tourism draw for the local economy
2. That it be a transformative educational experience for the region.

Portland took advantage of many local resources; the Oregon Convention Center was a well designed space to hold the event. They put together a substantial tour program with a variety of price points.

On site they had five components:

1. The technical fair itself.
2. The Academic Showcase provided space for major Oregon colleges and universities.
3. Industry Showcase. Industry leaders were invited to participate with the understanding that they were to bring exhibits that provided quality interactive participation. This was their pay to play area. Each of the exhibitors paid a minimum of \$50K to participate.
4. Discovery Showcase. There were 50 high-end exhibits and displays from companies or universities. The one requirement was that the companies had to send technical exhibitors who could talk about the exhibits or display and they had to be interactive so kids could do something. The students response was very enthusiastic
5. The Teachers requested a quiet area. They had a special auditorium with David Heil from Newton's Apple, an innovative television program on PBS sponsored by 3M Learning Software, who would interview people who were doing interesting things with their students. A three-minute video introduction of the student, the lead researcher (mentor) and project were shown to the audience before they came on stage to be interviewed. It clicked with the attendees and was very well attended. One unexpected result was that the students would rush the stage for autographs from the presenters.

Intel provided special funding targeted at Portland Title 1 schools. This funding provided curriculum throughout the year for the Title I schools. Because of this funding and curriculum 250 students attended Intel ISEF from their own regional affiliated Intel ISEF fairs. The committee received a grant from the M. J. Murdock Foundation to bring 6000 students in from private and public schools to view all aspects of the fair.

Portland worked hard with local industry and schools. The newspaper provided a 16-page insert that ran the Sunday before the conference started. An additional 3000 copies were placed in the Intel ISEF registration bags. The organizing committee sold all the advertising for this insert. The newspaper treated the insert as an editorial section and provided their best reporters to write articles and profile students from around the world. Each section at some time during the week ran a front-page story about the event.

*"Many of the past Intel ISEF conferences were able to influence the local stu-*

*dents in science and engineering either indirectly (by viewing the projects on public day) or directly by obtaining grants for Title I schools and helping those schools develop their own science fairs."*

*"Portland has seen a direct increase in Science Fair participation after they hosted the Intel ISEF event."*

It is expected that when Utah hosts the Intel ISEF it, too, will see an increase in participation as well as more students continuing their studies in science, engineering, and mathematics.

*"Several of the Intel ISEF conferences were left with a positive bank balance that was then endowed to science fairs in that state."*

#### **ISEF 2005 – Phoenix, Arizona (Pit Lucking, Chairman)**

The conference was held in the Phoenix Civic Center which is centrally located in downtown Phoenix. Close to the center is Copper Square, which is a compilation of museums, historical buildings etc. These facilities were free to all attendees and included food and music. The conference had a unique event for attendees at Rawhide Western Town and Steakhouse, providing excellent food and music for square and county line dancing. They also hosted a rodeo with fireworks. The speakers, Dr. Sally Ride and Dr. Brian Greene, were very well received. The "Excellence in Science and Technology Panel, presented by Agilent Technologies", consisted of eleven Nobel Laureates who answered questions from the finalists in the audience. The Arizona Science Center was a popular attraction and a key participant.

The conference was very well planned and executed with many volunteers and judges.

#### **ISEF 2006 – Indianapolis, Indiana (Elisa Rice, Chairman):**

The Indianapolis committee's estimated budget is \$1,770,000 with \$1,010,000 committed to date. Their conference will be held at the Indianapolis Convention Center in downtown Indianapolis. All of the convention center is dedicated to this event for the week. They are recruiting judges from six colleges and universities from around the state. The main tour will consist of visiting the Indianapolis Motor Speedway in addition to tours of local colleges, universities and commercial tours.

#### **ISEF 2007 – Albuquerque, New Mexico (Russ Fisher Ives, Chairman):**

The theme for Intel ISEF 2007 is "Creating a New Element." A local artist was commissioned to depict the past, present and future in a piece entitled "Ancient Inquiry." Their web page is being created by an individual who has 14 years of experience with Walt Disney Studios in California. Their budget consists of: \$50,000 cash in-hand; \$100,000 from the New Mexico State Legislature in 2006; other State funding sources \$400,000; and in-kind donations from the city of Albuquerque. The committee is planning a young researcher's banquet as well as site visits to regional laboratories. Marshall Monroe, with Disney, is to compose a 10 minute Symphony in commemoration of ISEF 2007.

**ISEF 2008 – Atlanta, Georgia:**

Atlanta's theme for their conference is "Scientists Uniting the World Through Science."

Their main University participant will be Georgia Tech, providing technical support, resources, personnel, and meeting space for many of the activities. They feel confident that they can handle the attendees of Intel ISEF easily because of the size of their convention center, airline accessibility, and hotels close to the convention center. They have several new developments, such as the expansion of The World of Coca-Cola, the Museum of Art, Symphony Hall, Atlantic Station-Live, Six Flags and other retail, residential outlets, similar to Utah's Gateway Center. The Georgia Aquarium-the world's largest aquarium – will open November 2005. Atlanta has "City Ambassadors" which provide a security presence and serve as tour guides. This group of people is briefed every Monday as to what groups will be visiting Atlanta. Atlanta is noted for the Summer Olympic Games and the Super Bowl. Atlanta is looking at a budget – \$1.5 million. Their fundraising goal is \$2.5 million. Current goal is to raise \$750,000 by December 2005. The Atlanta committee has commissioned a song for Intel ISEF 2008, "The Big A." The committee will be planting a peach tree on Peach Street in honor of the Intel ISEF 2008. Despite the name there are no peach trees in existence on Peach Street.

**ISEF 2009 – Reno, Nevada (Steve Wells, Chairman):**

The theme for Intel ISEF 2009 is "Science, Art and Mathematics (SAM)."

Their proposed budget for the conference is \$3.7 million (\$1.5 million to come from gambling revenues); other funding sources are the Nevada State Legislature (\$300,000) the Nevada Mining Commission, and the City of Reno. The conference will be held at the Reno-Tahoe – Sparks Convention Center. The Hilton Hotel will be called "Geek Central" and can accommodate all fair attendees, including volunteer judges. The Reno International Airport is served by 11 airlines

**ISEF 2010 – San Jose, California**

The conference hotels will be the Fairmont Hotel and Montgomery Hotel. The Convention Center will have ample square footage and venue halls. It is likely that San Jose's excellent science center, The Tech, will play a significant role.

### 3. How have other host cities organized their event?

**ISEF 03—Cleveland:** The committee started with a core group of twelve for organization and then grew to twenty-five.

**ISEF 04—Portland:** The host city coordinating committee had several big names that were not as useful as they hoped. They had a hard-core small group of three that drove the event from strategic standpoint including the local firm Applied Materials. They also had an Operating Committee, which consisted of three key people and the Fair Director during the entire event. The committee was able to recruit two senior industry execu-

tives to drive the operations pro bono. Once the committee was far enough along in the planning they shifted to a meeting every Monday morning. Science Service recommends at least 12-15 committees, each with their own assignment.

All ISEF cities had/have an organizing committee, which varied from ten to twenty five people.

*“Most of the committees were able to use a main organizing committee and then use other members for the subcommittees. It is strongly encouraged to limit the executive committee to a group of five.”*

For the 2008 Utah bid, a preliminary organizing committee was established and expanded to a total of 15 sub-committees including:

1. Finance
2. Operations
3. Judging, Public School Liaison
4. Marketing/Public Relations
5. Tours and Transportation
6. Hotels/Housing
7. Volunteer Liaison
8. Registration,
9. Meal Function and Entertainment
10. Foreign Liaison
11. Graphics
12. Display and Safety

These committees can likely be reactivated to plan an ISEF 2011 initiative for Utah.

#### 4. What was their timeframe?

**ISEF 03—Cleveland:** The ISEF 2003 conference was awarded in 1997-98. They had four years to plan and develop the conference. Cleveland sent a group of their committee to two fairs before theirs, i.e., Lexington, KY and San Diego, CA.

**ISEF 04—Portland:** The ISEF 2004 bid phase was completed in 1998. The proposal to host Intel ISEF misfired the first time because the Fair organizer did not have enough contacts (votes) on the Intel ISEF board for a majority vote. The time line was tight and the committee needed more time to assemble the small teams who would lead the committee, including the financials.

The Core members of the Operations Team were identified before the next Intel ISEF event and worked with the committees on the floor of the exhibit hall, registration, judging, etc. Portland wanted their committee members to have firsthand knowledge of the Intel ISEF event so that they would know what had to be done for their conference. Portland sent twenty people to the conference in Cleveland.

Many of these cities had four or more years to plan and execute the conference. The more time available before the conference, the better the planning and fundraising.

## 5. Budgets

**ISEF 03—Cleveland:** *“It is very expensive to do it well. The fair’s decorator and food were the most expensive items.”*

**ISEF 04—Portland:** The committee was aiming for a target of \$1.8 million. It was difficult to compare with a cash basis because much of the work was pro bono. The committee raised \$1.5 million in cash and spent \$1.4 million. \$400,000 was donated in pro bono. \$200,000 was left over to feed back into fairs and education. The net effect was they did not have to sacrifice anything they wanted. The core committee authorized the operations team to spend more money if they raised more money.

## 6. Fundraising methods

**ISEF 03—Cleveland:** *“The committee was very good in the fundraising arena. They were able to leave an endowment for the Northeast Science and Engineering Fair. The co-chairs had the responsibility to deal with budget constraints. The funds raised were primarily private funds. However, the city of Cleveland did contribute sizable discounts on parking.”*

**ISEF 04—Portland:** *“Mostly private corporations. \$100,000 was donated from the University system through the chancellor’s office because they understand the impact science fairs have on students and their (Universities) futures. One key partner was Oregon Health Sciences University. They provided an Educational Outreach team for a year that worked on the Title I, private and public schools.*

The conference was leveraged as a pro bono event. The committee paid little for professional services. There are radically different models. You can either raise community support or money. Portland had to work with community support because they knew they would have a difficult time raising the money needed for the conference.”

Several of the conferences received state support as well as local financial or in-kind donations. If the conference is to be successful it would be vital to obtain support from the Utah State Legislature. It would also require a significant in-kind donation from Salt Lake County, in the use of the Salt Palace Convention Center, and Salt Lake City, perhaps related to parking.

## 7. Speakers

**ISEF 03—Cleveland:** The conference was held in Cleveland during the celebration of 100 years of flight. Their speakers included a panel of astronauts. Many of the top award winners were able to have their pictures taken with astronauts. John Glenn was one of the featured speakers in addition to the city's mayor.

**ISEF 04—Portland:** Pat Gelsing (Intel), Rodney Brooks (MIT), ten to twelve Nobel laureates on panel, and four Professors. Oregon considers itself a high tech state; Portland wanted to do something to send that message. Portland also introduced the Mind to Market. They paired up National Club Industry Association of America (NCIAA) to work with MIT. The committee invited some of the students to present research as a business plan to venture capitalists.

Portland ran their own list of speakers and presentations in addition to those set up by Science Service. The program provided a platform for local doctors, inventors, and a local owner of a graphics company. They also hosted a "Big Ideas Event" with an open room of facilitators to drive discussions on the latest problems.

**ISEF 05—Phoenix:** had a panel of eleven Nobel Laureates that answered questions directly from the Intel ISEF finalists. Many of the Nobel Laureates continued through the week and were seen on the exhibit floor talking with many of the finalists.

The keynote addresses in Phoenix were given by Dr. Sally Ride, the first American woman in space and current President and CEO of Imaginary Lines, Inc., and by Dr. Brian Greene, physicist and author of "The Fabric of the Cosmos."

## 8. Attendance

The numbers of registered attendees has grown from 3742 for the 2000 conference to 4460 in Phoenix. (See Table IV.)

The Intel ISEF conference in Phoenix was attended by people from 45 different countries. If Utah was to host the Intel ISEF this would provide another way to further promote the state for tourism.

As the Intel ISEF conferences grow it would be possible to have over 5600 people attending the Utah conference and contributing to the local economy by way of hotel rooms, meals and incidental spending.

## 9. Facilities

**ISEF 03—Cleveland:** The Cleveland Convention Center is centrally located near downtown hotels, restaurants, and attractions, offers 375,000 square feet (34,838 square meters) of usable exhibition space, accommodating 1,500 individual exhibits with ease.

**ISEF 04—Portland:** All events were held inside the Oregon Convention Center, including a sit down dinner and stage show for 3000 people. Many companies, hosted alcohol free cocktail parties for the students. The Oregon Convention Center is non-union.

**ISEF 05—Phoenix:** The Phoenix Civic Plaza has space totaling over 220,000 square feet with the capacity to expand into a Grand Ballroom and meeting rooms. A 28,000-square foot state-of-the-art, Grand Ballroom boasts a 6,600-square foot stage with computer-operated, high-tech sound and lighting systems located overhead in an elevated control bridge.

Utah has a prime facility with the Salt Palace Convention Center. All conference events could be held in one facility with hotels located nearby. Many people expressed support for all the events and hotels to be centrally located to the facility.

After watching the bid updates from the selected cities at ISEF 2005 for 2006-2010 locations, it is strongly recommended to use students in part of the bid presentation. Specifically, the students from Utah that won the Ricoh Sustainable Development Award in Phoenix would be a good choice. The conference is for the finalists but the presentations and updates were geared toward the advisory committee and adults. It should be the organizing committee's job to make sure to not lose sight of the fact that the conference is for the finalists.

## 10. Possible tour venues to consider if Salt Lake City is selected to host Intel ISEF in 2011

Utah has many academic, cultural, athletic and recreational facilities that could be used when Utah hosts the Intel ISEF conference.

### **Academic:**

Brigham Young University  
Dixie State College  
Southern Utah University  
Utah State University

College of Eastern Utah  
Salt Lake Community College  
University of Utah  
Weber State College

### **Business and Industrial:**

Alliant Tech (ATK)  
Hill Air Force Base (HAFB)

Evans and Sutherland (E and S)  
Kennecott Copper Mine

### **Cultural:**

Capitol Theatre  
Delta Center Concert  
Odyssey Dance Theater  
Rodgers Memorial Theatre  
Repertory Dance Theatre  
Utah Symphony Opera

Children's Dance Theatre  
Hale Center Theater  
Pioneer Memorial Theatre  
Ririe Woodbury Dance Company  
Salt Lake Acting Company  
West Valley Cultural Center

**Athletic:**

REAL Soccer	Salt Lake Stingers
Utah Grizzlies Hockey	Utah Jazz

**Recreational:**

Five national parks in Utah	Green River float trips
Lagoon	Larry Miller's Racetrack (will be operational by 2011)
Liberty Park	Olympic Luge Park
Rocky Mountain Raceway	Skiing

**C. Recommendations**

- We recommend that the State Science Advisor work with the Travel Council and Salt Lake Visitors and Convention Bureau to establish and organize a process for recruiting Intel ISEF 2011 to Salt Lake City, Utah.
- An initial budget of \$25,000 be made available to the organizing committee for planning and solicitation of the 2011 bid. The bid must be presented to ISEF at its May, 2006 meeting.
- A State commitment of \$200,000 for FY 2011 will be needed for the actual conduct and operation of ISEF 2011 if the venue is awarded to Utah.

## **Appendices list**

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A: List of Abbreviations

B: ISEF Topical Categories

C: Bid outline

D: USOE State Science Coordinators

E: Utah/National/International Competitions

## Appendix A: List of Abbreviations

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<b>Abbreviation</b>	<b>Full Name</b>
AP	Advanced Placement
BYU	Brigham Young University
CUSEF	Central Utah Science and Engineering Fair
DBED	Department of Business and Economic Development
HHRSEF	Harold and Helen Ritchey Science and Engineering Fair
ISEF	International Science and Engineering Fair
MIT	Massachusetts Institute of Technology
NCIAA	National Club Industry Association of America
SLC	Salt Lake City
SLVSEF	Salt Lake Valley Science and Engineering Fair
SUSEF	Southern Utah Science and Engineering Fair
SWRE	Statewide Recognition Event
U of U	University of Utah
UEES	Utah Engineering Experiment Station
USC	Utah Science Center
USOE	Utah State Office of Education
WSU	Weber State University

## Appendix B: ISEF Topical Categories

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### **Behavioral and Social Sciences**

Human and animal behavior, social and community relationships – psychology, sociology, anthropology, archaeology, ethology, ethnology, linguistics, learning, perception, urban problems, reading problems, public opinion surveys, educational testing, etc.

### **Biochemistry**

Chemistry of life processes – molecular biology, molecular genetics, enzymes, photosynthesis, blood chemistry, protein chemistry, food chemistry, hormones, etc.

### **Botany**

Study of plant life – agriculture, agronomy, horticulture, forestry, plant taxonomy, plant physiology, plant pathology, plant genetics, hydroponics, etc.

### **Chemistry**

Study of nature and composition of matter and laws governing it – physical chemistry, organic chemistry (other than biochemistry), inorganic chemistry, materials, plastics, fuels, pesticides, metallurgy, soil chemistry, etc.

### **Computer Science**

Study and development of computer hardware, software engineering, internet networking and communications, graphics (including human interface), simulations / virtual reality or computational science (including data structures, encryption, coding, and information theory).

### **Earth Science**

Geology, mineralogy, physiography, oceanography, meteorology, climatology, speleology, seismology, geography, etc.

### **Engineering**

Technology projects that directly apply scientific principles to manufacturing and practical uses – civil, mechanical, aeronautical, chemical, electrical, photographic, sound, automotive, marine, heating and refrigeration, transportation, environmental engineering, etc.

### **Environmental Science**

Study of pollution (air, water, and land) sources and their control, ecology.

### **Mathematics**

Development of formal logical systems or various numerical and algebraic computations, and the application of these principles – calculus, geometry, abstract algebra, number theory, statistics, complex analysis and probability.

### **Medicine and Health**

Study of diseases and health of humans and animals – dentistry, pharmacology, pathology, ophthalmology, nutrition, sanitation, dermatology, allergies, speech and hearing, etc.

**Microbiology**

Biology of microorganisms – bacteriology, virology, protozoology, fungi, bacterial genetics, yeast, etc.

**Physics**

Theories, principles, and laws governing energy and the effect of energy on matter – solid state, optics, acoustics, particle, nuclear, atomic, plasma, superconductivity, fluid and gas dynamics, thermodynamics, semiconductors, magnetism, quantum mechanics, biophysics, etc.

**Space Science**

Astronomy, planetary science, etc.

**Zoology**

Study of animals – animal genetics, ornithology, ichthyology, herpetology, entomology, animal ecology, paleontology, cellular physiology, circadian rhythms, animal husbandry, cytology, histology, animal physiology, invertebrate neurophysiology, studies of invertebrates, etc.

# Appendix C: ISEF Host City Bid Outline

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ISEF host city bids need to cover the details listed below in a 20 minute presentation:

## 1. Financial status

- a. Estimated budget
- b. List of potential sponsors
- c. Possibilities of other funds – amount and source and date of expected action.

## 2. Space

- a. Dates reserved
- b. Exhibition space
  - (1) Location
  - (2) Square feet available for finalist exhibits
  - (3) Square feet available for judge's discussion area
- c. Location of Welcoming Party
- d. Location of Opening Ceremonies
- e. Location of Special Awards Convocations
- f. Location of Intel ISEF Grand Awards Banquet
- g. Location of Mixers
  - (1) Adults
  - (2) Judges
  - (3) Finalists

## 3. Hotels

- a. Names
- b. Numbers of blockable rooms in each, and current prices (prior to Science Service negotiation)
  - (1) Distance from each hotel to Convention Center
  - (2) Busing plan (if needed)

## 4. Availability of restaurants in and near hotels

## 5. Source of judges

- a. Colleges and universities
- b. Hospitals and medical research centers
- c. Industry and industrial research centers
- d. Will there be any problems of getting enough for any particular category?

## 6. Weather

- a. Average maximum and minimum temperature for week of fair
- b. Average precipitation for month of fair

## 7. Airport

- a. Number of flights per day
- b. Lines serving airport

- c. Distance from hotels and exhibit center

**8. Tours**

- a. Tours taking place during Intel ISEF as part of program
- b. Commercial tours, paid for by participants, available before and after fair

**9. Organizational status (update Science Service as assigned)**

- a. General Chairperson – name and affiliation
- b. Assistant General Chairperson
- c. Finance Chairperson
- d. Operations Chairperson
- e. Judging Chairperson
- f. Tour Chairperson
- g. Housing and Registration Chairperson
- h. Meal Functions and Entertainment Chairperson
- i. Public Relations Chairperson
- j. School Liaison Chairperson
- k. Graphics Chairperson
- l. Foreign Liaison Chairperson

The rest of the items associated with becoming a host city and the requirements thereof (i.e. Financial obligations, Insurance, etc) can be found at [www.sciserve.org](http://www.sciserve.org)

## Appendix D: Utah Science Curriculum Coordinators List

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Distribution List Name: *Science Coordinating Committee*

### Members:

Barbara Gentry	barbara.gentry@jordan.k12.ut.us	801-412-2550
Bill Smith	bill.smith@granite.k12.ut.us	801-646-5000
Bobbie Roberts	broberts@m.tooele.k12.ut.us	435-833-1900
Brent McMillan	brent.mcmillan@cache.k12.ut.us	435-245-6093
Carl Shakespear	carl.shakespear@m.garfield.k12.ut.us	435-679-8835
Cindy Cunningham	ccunningham@weber.k12.ut.us	801-476-7800
Dan Taylor	taylord@chs.carbon.k12.ut.us	435-637-2463
Debra Spielmaker	debras@ext.usu.edu	Na
Doug Pusey	Pusey411@alpine.k12.ut.us	801-227-8748
Duke Johnson	djohnson@slco.org	Na
Emma Smith	esmith@box.elder.k12.ut.us	435-734-4840
Fonda Stitzer	stitzerf@m.ogdne.k12.ut.us	801-737-7300
Glo Merrill	gmerrill@murrayschools.org	801-264-7400
Grace Struiksmma	graces@ext.usu.edu	Na
Harvey Neuber	hneuber@scampus.logan.k12.ut.us	435-755-2395
J.J. Grant	grant@do.emery.k12.ut.us	435-687-9846
Jan Broxton	janet.broxton@slc.k12.ut.us	801-578-8599
Janice Hatch	janice.hatch@m.garfield.k12.ut.us	435-676-8821
Jed Jensen	jensenj@do.emery.k12.ut.us	435-687-9846
John Gardner	John_gardner@byu.edu	801-422-4636
Julie Marsh	jmarsh@nsummit.k12.ut.us	435-336-5656
Julie Quinn	jquinn@weber.k12.ut.us	801-452-4640
Ken O'Brien	Ken.obrien@slc.k12.ut.us	801-578-8599
Kevin Allen	kevin.allen@nsanpete.k12.ut.us	435-462-2452
Larry Madden	larry.madden@slc.k12.ut.us	801-578-8599
LeRon Ware	Leron.ware@sevier.k12.ut.us	435-527-4607
Lewis Mullins	lewis.mullins@piute.k12.ut.us	435-577-2912
Lisa Clark	lisa_clark@byu.edu	801-422-4636
Liz Snyder	Elizabeth.snyder@ssummit.k12.ut.us	435-783-4313
Louisa Stark	lstark@genetics.utah.edu	Na
Lynn Hunt	huntl@che.carbon.k12.ut.us	Na
Lynnette Johnson	lynnette@do.sanjuan.k12.ut.us	435-678-1200

Marvin Lowe	mlowe@mlms.logan.k12.ut.us	435-755-2370
Mary Kay Kirkland	mkirklan@boxelder.k12.ut.us	435-734-4800
Meri-Lyn Stark	mstark@parkcity.k12.ut.us	Na
Merry Haugen	mhaugen@parkcity.k12.ut.us	435-645-5600
Mike Wakefield	mwakefield@dcsd.org	435-725-4525
Myron Cottam	myron.cottam@m.garfield.k12.ut.us	435-676-8821
Nedra Call	nedra.call@nebo.edu	801-354-7400
Pam Jensen	pwittmann@weber.k12.ut.us	801-476-7800
Paul Nance	paul.nance@jordan.k12.ut.us	801-565-7478
Phyllis Embley	phyllis.embley@jordan.k12.ut.us	801-567-8100
Rich Moore	moorer@m.ogden.k12.ut.us	801-737-7300
Rich Tolman	tolmanri@uvsc.edu	801-863-4636
Ron Nielson	Nielson.ron@do.sanjuan.k12.ut.us	Na
Ron Twitchell	RonT@provo.edu	801-374-4800
Ron Wolff	rwoff@morgan.k12.ut.us	801-829-3411
Rusty Taylor	rusty.taylor@iron.k12.ut.us	435-586-2820
Sandra Tanner	tanners@m.ogden.k12.ut.us	801-785-8726
Scott Bassett	scott@m.millard.k12.ut.us	435-864-1000
Sharon Ohlhorst	sohlhorst@weber.edu	801-626-6000
Steve Leatham	steve.leatham@m.wasatch.k12.ut.us	Na
Steve Mangel	smangel@dscdmail.net	801-402-5261
Tim Black	timblack@ssanpete.k12.ut.us	435-283-4037
Todd Campbell	toddc@ext.usu.edu	801-402-6400
Tracy Davis	tracy.davis@m.beaver.k12.ut.us	435-438-2291
Travis Terry	terryt@m.kane.k12.ut.us	435-644-5821
Velma Itamura	velma.itamura@schools.utah.gov	801-538-7803
Vicki Lyman	Vicki.lyman@m.millard.k12.ut.us	435-864-5610

## **Appendix E: Utah/National/International Competitions**

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UTAH COMPETITIONS	TYPE OF COMPETITION	ELIGIBILITY	PRIZES	LOCATION	WEBSITE	NOTES
Central Utah Science & Engineering Fair	Science Fair	5th - 12th grade	Trip to ISEF, scholarships, cash and other prizes	Brigham Young University	<a href="http://cusef.byu.edu">http://cusef.byu.edu</a>	
Igniting Creative Energy Challenge	Knowledge based competition	K-12	Trip to Hawaii	Salt Lake City, UT	<a href="http://www.ignitingcreativeenergy.org">www.ignitingcreativeenergy.org</a>	
Salt Lake Valley Science & Engineering Fair	Science Fair	5th - 12th grade	Trip to ISEF, scholarships, cash and other prizes	University of Utah	<a href="http://www.utahsciencecenter.org/sciencefair">www.utahsciencecenter.org/sciencefair</a>	
Science & Engineering Fair of Utah	Science Fair	5th - 12th grade	Trip to ISEF, scholarships, cash and other prizes	Weber State University	<a href="http://community.weber.edu/sciencefair">http://community.weber.edu/sciencefair</a>	
Southern Utah State Science & Engineering Fair	Science Fair	5th - 12th grade	Trip to ISEF, scholarships, cash and other prizes	Southern Utah University	<a href="http://www.suu.edu/sci/physci/scifair/">http://www.suu.edu/sci/physci/scifair/</a>	
Utah Envirothon	Knowledge based competition	High School	Winners win trip to National event	Rotates throughout Utah	<a href="http://www.utahenvirothon.org">www.utahenvirothon.org</a>	
Utah's Science Olympiad	Science & Technology Competition	Jr. & High School	Trophies and medals	Weber State University	<a href="http://departments.weber.edu/sciencecenter/ScienceOlympiad/Olympiadpage.htm">http://departments.weber.edu/sciencecenter/ScienceOlympiad/Olympiadpage.htm</a>	
Utah State Math Contest	Math test	High School		Weber State University	<a href="http://faculty.weber.edu/tszabo/smc/">http://faculty.weber.edu/tszabo/smc/</a>	

<b>NATIONAL COMPETITIONS</b>	<b>TYPE OF COMPETITION</b>	<b>ELIGIBILITY</b>	<b>PRIZES</b>	<b>LOCATION</b>	<b>WEBSITE</b>	<b>NOTES</b>
Intel International Science and Engineering Fair	Science Fair	High School	Scholarships, cash, internships	Rotates throughout US	<a href="http://www.sciserv.org/iseif/index.asp">http://www.sciserv.org/iseif/index.asp</a>	
Christopher Columbus Awards	Community Improvement Plan Essay	Middle School	Finalists receive trip to Disneyworld and \$2,000. Grand prize winner receives \$25,000 to implement plan	N/A	<a href="http://www.christophercolumbusawards.com">www.christophercolumbusawards.com</a>	
FIRST Robotics Competition	Problem Solving Competition	High School	Scholarships	Rotates	<a href="http://www.usfirst.org/robotics">www.usfirst.org/robotics</a>	
President's Environmental Youth Awards	Environmental Awareness Projects	6-12	Grants to implement plan for winning project	N/A	<a href="http://epa.gov/enviroed/awards.html">http://epa.gov/enviroed/awards.html</a>	
Radical Renovation	Environmental Improvement Plan Essay	K-6 teachers	\$100,000 to implement plan in winning essay	N/A	<a href="http://plasma.nationalgeographic.com/gogreen/for">http://plasma.nationalgeographic.com/gogreen/for</a>	Escalante Elementary 2005 winner
North American Canon Envirothon	Problem Solving Competition	9-12, state winner	Scholarships and other prizes	Rotates	<a href="http://www.envirothon.org/about/index.htm">http://www.envirothon.org/about/index.htm</a>	
Environmental Project Olympiad	Environmental Science Fair	13-19 years old	Medals	Turkey	<a href="http://www.inepo.com">www.inepo.com</a>	
The Afro-Academic, Cultural, Technological and Scientific Olympics	Essay Competition	9-12 African American		N/A	<a href="http://www.montgomerycollege.edu/actso/actsomain.htm">www.montgomerycollege.edu/actso/actsomain.htm</a>	
US Biology Olympiad	Exam based Competition	High School	Finalists receive trip to George Mason University, Winners @ National Competition receive trip to International Competition	Fairfax, VA	<a href="http://www.cee.org/usabo/index.shtml">www.cee.org/usabo/index.shtml</a>	
National Association of Rocketry	Flight contest	7-12th grade teams	Savings Bonds, Cash	Arlington, VA	<a href="http://www.rocketcontest.org">www.rocketcontest.org</a>	
National Science Bowl	Fuel Cell Car Race	High School	Money for schools, trophies, trips	Washington D.C.	<a href="http://www.sci.ed.science.doe.gov/nsb">www.sci.ed.science.doe.gov/nsb</a>	
National Aeronautics & Space Administration	Futuristic Air Vehicle Scenarios	High School	Internships w/ NASA and small grants	Hampton, VA	<a href="http://avst.larc.nasa.gov/competitions_high.html">http://avst.larc.nasa.gov/competitions_high.html</a>	
American Mathematics Competition	Mathematics Problem Solving	grades 6-8 and 9-12		National & International rotating locations	<a href="http://www.uni.edu/amc">www.uni.edu/amc</a>	
USA Mathematical Talent Search	Mathematics Problem Solving	6-12	selection process for Math Olympiad competition		<a href="http://www.usamts.org">www.usamts.org</a>	
Mandelbrot Competition	Mathematics Problem Solving	High School	N/A	Individual schools	<a href="http://www.mandelbrot.org/">http://www.mandelbrot.org/</a>	
International Mathematics Olympiad	Mathematics Problem Solving	High School	Medals	Rotates around the world	<a href="http://olympiads.win.tue.nl/imo/">http://olympiads.win.tue.nl/imo/</a>	
Tournament of Towns	Mathematics Problem Solving	Junior or Senior Divisions	N/A	Rotates around the world	<a href="http://www.math.toronto.edu/oz/turgor/about1.php">http://www.math.toronto.edu/oz/turgor/about1.php</a>	
Micron Foundation	Merit Based Scholarship Competition	Seniors only	Scholarships, internships	Boise, ID	<a href="http://www.micron.com/about/giving/foundation/scholars.html">http://www.micron.com/about/giving/foundation/scholars.html</a>	

<b>NATIONAL COMPETITIONS</b>	<b>TYPE OF COMPETITION</b>	<b>ELIGIBILITY</b>	<b>PRIZES</b>	<b>LOCATION</b>	<b>WEBSITE</b>	<b>NOTES</b>
AAPT Physics Bowl	Multiple Choice Test	9-12	AAPT memberships, gift certificates, trip to AAPT summer meeting.	N/A	<a href="http://www.aapt.org/Contests/physicsbowl.cfm">http://www.aapt.org/Contests/physicsbowl.cfm</a>	
High School Photo Contest	Photography Contest	12-Sep	Prizes from Vernier Software & Technology	N/A	<a href="http://www.aapt.org/Contests/photocontest.cfm">http://www.aapt.org/Contests/photocontest.cfm</a>	
Video Contest	Physics in Action Videos	9-12			<a href="http://www.aapt.org/Contests/videocontest.cfm">http://www.aapt.org/Contests/videocontest.cfm</a>	
U.S. Physics Talent Search	Point based, activities Physics Competition	10-18 yrs of age	Trips to awards ceremony and/or physics research labs	N/A	<a href="http://www.usphysicstalentsearch.org">www.usphysicstalentsearch.org</a>	
Destination Imagination	Problem Solving Competition	all		separate state affiliates	<a href="http://www.destinationimagination.org">www.destinationimagination.org</a>	
National Academic League Awards	Question & Answer Contest	5th - 12th grade teams	Trophies	Rotates throughout Utah	<a href="http://www.nationalacademicleague.org">www.nationalacademicleague.org</a>	Eisenhower Jr. High 2005 Winners
National Middle School Science Bowl	Question & Answer Contest	6th-8th grade teams only	Cash for school	Golden, CO	<a href="http://www.sci.ed.science.doe.gov/nmsb/default.htm">www.sci.ed.science.doe.gov/nmsb/default.htm</a>	
Young Naturalist Awards	Research Based Essay Contest	7th-12th grade	Scholarships & cash. Finalists win trip to New York to meet museum scientists and attend awards ceremony	New York City, NY	<a href="http://www.amnh.org/nationalcenter/youngnaturalistawards">www.amnh.org/nationalcenter/youngnaturalistawards</a>	
Center for Excellence in Education	Research Projects	Seniors only	Room, board and tuition for 6 week academic program @ Massachusetts Institute of Technology	Boston, MA	<a href="http://www.cee.org/rsi/index.shtml">www.cee.org/rsi/index.shtml</a>	
Tech Explore	Research Projects	K-12	Trophies, certificates and acknowledgement on Tech Explore website. Top teams attend awards ceremony in Washington DC	N/A	<a href="http://www.techxplore.org">www.techxplore.org</a>	
Intel Talent Search	Research Projects & Interviews	12	Scholarships and laptops	Washington D.C.	<a href="http://www.intel.com/education/sts/">http://www.intel.com/education/sts/</a>	
Siemens Westinghouse Competition	Research Reports	Seniors only	Scholarships	Iselin, New Jersey	<a href="http://www.siemens-foundation.org">www.siemens-foundation.org</a>	
FIRST Lego League	Robot Building Competition	9-14 year olds	Trophies	Atlanta, GA	<a href="http://www.usfirst.org/robotics/fliego.htm">www.usfirst.org/robotics/fliego.htm</a>	
Six Flags America Roller Coaster Building Contest	Rollercoaster Building Competition	5-8 and 9-12	Six Flags in Baltimore		<a href="http://www.aapt.org/Contests/rollercoaster.cfm">http://www.aapt.org/Contests/rollercoaster.cfm</a>	
The Dupont Challenge	Science Essay	grades 7-9 and 10-12	Trip to Houston Space Center, \$1500 grant	mail contest	<a href="http://www.gcommm.com/dupont">www.gcommm.com/dupont</a>	

NATIONAL COMPETITIONS	TYPE OF COMPETITION	ELIGIBILITY	PRIZES	LOCATION	WEBSITE	NOTES
National American Indian Science & Engineering Fair	Science Fair	5th -12th grade American Indian Students	Scholarships, Grand Prize Winners travel to the Intel ISEF for the current year	Albuquerque, NM	<a href="http://www.aises.org/events/naief">www.aises.org/events/naief</a>	
Young Inventors Awards Program	Tool Building	2nd - 8th grade	\$10,000 Savings Bond for 2 Grand Prize Winners, \$5,000 Savings Bonds for 10 Finalists	N/A	<a href="http://www.nsta.org/programs/craftsman">www.nsta.org/programs/craftsman</a>	
Exploravision Awards	Visual & Written Science Fair Based Presentations	K-12 (split into age groups of K-3, 4-6, 7-9 and 10-12)	Savings Bonds, Laptops	Washington D.C.	<a href="http://www.exploravision.org/2004/index.htm">www.exploravision.org/2004/index.htm</a>	
Young Scientist Challenge	Visual & Written Science Fair Based Presentations	5-8	Finalists receive trip to Washington DC, top 40 finalists receive scholarships	Washington D.C.	<a href="http://school.discovery.com/scienceaircentral/dyisc">http://school.discovery.com/scienceaircentral/dyisc</a>	
Oracle Think Quest	Website Development	9-19 year old teams	Trip to San Francisco for awards ceremony, winning websites published in ThinkQuest Library		<a href="http://www.thinkquest.org">www.thinkquest.org</a>	2 winners from Utah (Heber and Sandy)
U.S. Physics Team	Problem Solving Competition	High School	Finalists receive trip to international contest which rotates throughout Europe	Rotates	<a href="http://www.aapt.org/Contests/olympiad.cfm">http://www.aapt.org/Contests/olympiad.cfm</a>	