60th ANNUAL FRONTIERS OF SCIENCE INSTITUTE

APPLICATION INFORMATION/DEADLINE: The priority deadline for applications is March 12th; the extended deadline is May 7, 2018. Colorado student applicants will be considered for, but not guaranteed, full or partial scholarship admittance. Students meeting FSI admission qualifications, and not receiving a scholarship, may be invited to attend as an independent scholar (responsible for all fees associated with attendance ~$4,000).

WOULD YOU LIKE TO...

...spend six weeks immersed in a learning-for-the-thrill-of-learning experiential STEM (science, technology, engineering & mathematics) curriculum?

...receive an early introduction to college life and the interactions associated with community living?

...experience educational, personal, and social growth with peers who share similar interests?

...meet professionals in various STEM fields, become acquainted with STEM career opportunities, and assist with on-site field studies during field trips, industrial tours and seminars?

...conduct in-depth scientific research, learn to write a scientific paper, design a scientific poster, develop a website and PowerPoint presentation?

...earn UNCO college credit and receive a scholarship to attend the University of Northern Colorado?

WHEN? June 17 - July 28, 2018

WHERE? University of Northern Colorado, Greeley, CO

WHO CAN APPLY? Colorado residents currently in their sophomore or junior year (10th or 11th grade) of high school.

COST OF FSI PARTICIPATION

The University of Northern Colorado is the host site for the Frontiers of Science Institute that is sponsored by many corporations, foundations, and individuals who elect to promote youth STEM education. Each year, Colorado student applicants are considered for available scholarships that may pay all or partial room and board expenses to attend FSI's six-week program. Scholarship admittance is not guaranteed.

- Cost of attendance for in-state full scholarship recipients is a $1,000 registration fee plus UNCO tuition (~$240), if choosing to take the course for UNCO college credit. This credit may be transferrable to a college or university of your choice. [Partial waivers may be granted due to financial hardship.]

- Partial scholarship recipients will pay a portion of their room & board, as well as the $1,000 registration fee and UNCO tuition (~$240), if choosing to take the course for UNCO college credit. This credit may be transferrable to a college or university of your choice. [Partial waivers may be granted due to financial hardship.]
Cost of attendance for independent scholars is $3,500 plus UNCO tuition (~$240), if choosing to take the course for college credit. This credit may be transferrable to a college or university of your choice. (Payment arrangements are available; the $1,000 registration fee is fully waived.)

QUALIFICATIONS:

- A strong interest in and aptitude for STEM (science, technology, engineering, mathematics) subjects, (course emphases vary each year and may be determined by funding).
- A high level of self-discipline, dependability, social maturity, strong work ethic, and positive attitude.
- Good physical health.
- A strong desire to challenge yourself and to engage in STEM investigations. Overnight field trips (with camping) may be scheduled and are mandatory for each participant.
- An interest in, and appreciation for differences in people, cultures, and ideas.

HOW DO YOU APPLY?

1. Complete the application form that accompanies this announcement. (Schools may duplicate the form, attain one from the website (www.fsiunc.org), or contact lori.ball@unco.edu.

2. Request three letters of recommendation* from each of these individuals:
   a. A science, technology, or mathematics teacher.
   b. An English teacher.
   c. Your guidance counselor.

   These letters should provide an evaluation of your ability for self-directed work, your ability to work in harmony with others, and your dependability as a member of a social group. Three (3) letters are required to complete your application.

3. Request an official transcript of your high-school grades, including grades for the first semester of the current school year. Also include available standardized test scores (PSAT/ACT/SAT).

4. The above materials should be sent all together by email (lori.ball@unco.edu) or regular mail to the address listed on page four of this application. Application materials should be postmarked no later than March 12 for priority submission and no later than May 7 to meet the extended deadline.

GOALS OF THE FRONTIERS OF SCIENCE INSTITUTE (FSI)

FSI is designed for high-school sophomores and juniors (rising juniors and seniors) with a strong interest in and aptitude for STEM (science, technology, engineering and mathematics). FSI activities are designed to give students a better understanding of STEM and the nature of scientific investigations. Participants will explore some problems and limitations in STEM and will be encouraged to continue with advanced STEM studies and the eventual pursuit of a STEM career.

It is intended that FSI should produce these results:

- Increase students' understanding of important basic STEM principles and advances at the cutting-edge of science.
- Help students recognize the interdependence and relationships among STEM subjects.
- Help students understand how mathematics and written and oral communications are used to interpret and report STEM research.
60th ANNUAL FRONTIERS OF SCIENCE INSTITUTE (FSI)
June 17 – July 28, 2018
UNIVERSITY OF NORTHERN COLORADO, GREELEY, COLORADO

COLORADO APPLICATION FORM

Priority Deadline: March 12, 2018/Extended Deadline: May 7, 2018

Students should carefully read the enclosed announcement and all instructions before completing this application form. To be considered for admission you must submit:

1. This four-page application properly completed.
2. Three letters of recommendation (can be mailed w/application or emailed for online submission):
   a. from a science, technology or mathematics teacher.
   b. from an English teacher.
   c. from a guidance counselor.
3. A transcript of your high school grades including the first semester of the current school year.
   Any available standardized test scores should be included (PSAT, ACT, SAT)

All materials should be sent together in one envelope. For consideration of first-round awards, your application and all supporting materials should be received by the priority deadline date of March 12, 2018. Applications received by the extended deadline date of May 7, will be considered for second-round FSI admission and/or scholarship selections. A postmark date is sufficient. Email completed application materials to lori.ball@unco.edu or mail to:

Lori K. Ball, Director
Frontiers of Science Institute
University of Northern Colorado
501 20th Street, CB 123
Greeley, CO 80639

1. PLEASE PRINT CLEARLY (in ink) OR TYPE ALL ANSWERS (preferred)

Name: _______________________________ last first middle initial

Address: _____________________________ mailing address
city state zip code

Age: _______ Sex: ___M ___F Birthdate: ___________ Year in school (So, Jr): ________

Student Email Address/Cell #: ________________________________

Parent Email Address/Cell #: _________________________________

School: ______________________________ School Phone: (____) ____________

GPA: __________ PSAT/ACT Scores: _______/_________ Class Rank: _______/_________

Statistical Data (has no bearing on admittance into program - preferred, not required)

Ethnic Background: _____ African American _____ Asian Indian _____ Asian/Pacific _____ Caucasian _____ Latino/Hispanic
   _____ Native American _____ Other: __________________________________________

Are you first-generation college bound? ___ Yes ___ No Do you live in a rural _______ or an urban area _______?

How did you first learn about FSI? _______________________________________________________

Do you have family members who previously attended FSI? ___ No ___ Yes (If Yes, who?) __________________________
2. Please answer all questions briefly, yet clearly within the space provided:

A. List other institutions or programs, outside of your high-school courses and activities, in which you have participated (summer camps, college courses, community/volunteer activities, hobbies, etc.).

B. List all extra-curricular high school activities, since 9th grade, in which you have participated (student council, Science Olympiad, band, drama, FBLA, publications, athletics, MESA).

C. List all high school honors and awards, as well as any science fair projects you have completed.
   1. Honors/Awards:

   2. Science Fair Projects (do not include regular science course lab activities):

D. In paragraph form, describe what you perceive as your most favorable and least favorable characteristics (no physical traits please).
E. Please **type and attach** a 250 to 350-word essay explaining your interests in STEM (science, technology, engineering & mathematics), why you wish to attend FSI, what your expectations are of the program, and why you should be selected for an FSI scholarship.

F. While attending the six-week FSI program, you will be living in close contact with about thirty of your peers. What contributions will you make to your residential-life community and how do you hope to grow personally from the experience?

G. List any special skills (i.e., artistic, proficiency in Web Design, public speaking, writing, etc.).

H. **Concerning research**, rank the top three subject areas (1 to 3) in which you are most interested.

   ___ Archaeology  ___ Astronomy  ___ Atmospheric Science  ___ Cellular/Molecular Biology  ___ Chemistry
   ___ Computer Programming  ___ Dietetics  ___ Ecology  ___ Engineering  ___ Env. Earth  ___ Geology
   ___ Mathematics  ___ Meteorology  ___ Physics  ___ Pre-Health/Biomedical  __________________ Other

I. List **at least one** advanced topic that you would like to learn about in each area:

   **Science:**
   
   **Technology:**
   
   **Engineering:**
   
   **Mathematics:**

J. Which is your anticipated education degree goal beyond high school?

   1. Bachelor’s ___  Masters ___  Doctorate ___  Other __________________

   2. List three (3) careers that interest you.

   1)  
   2)  
   3)  

K. Are you interested in taking the FSI course for college credit (4 credits)?  ___ Y  ___ N
Priority applicants will be notified of their status by mid-April; extended deadline applicants by mid-May. Scholarship admission is competitive.

3. **Statement of Applicant**

I, __________________________, verify that I have answered all of the above questions truthfully, and that my interest in attending FSI is sincere. I understand in the event that I am accepted to attend the 2018 summer program on scholarship or as an independent scholar, that I am making a six-week commitment.

**Signature of Applicant:** __________________________ **Date:** __________________________

(if you are submitting your FSI application online and do not have an electronic signature, please mail page 4 to FSI with appropriate signatures)

4. **Statement of Parent/Guardian:**

As the parent/guardian of the above-named applicant, I/we approve __________________________’s application (circle which) for admission to the Frontiers of Science Institute. I/we accept responsibility for payment of the non-refundable $1,000 FSI registration fee in the event my/our child is selected as a 2018 scholar ___ or due to our family’s extreme financial hardship, I/we have attached a detailed letter requesting a partial waiver of the registration fee ___ (proof of income may be requested). I understand the registration fee is payable to FSI upon our final acceptance of an offer to attend.

I/we also understand that neither the University of Northern Colorado nor the Frontiers of Science Institute will provide insurance on, or provide payment of, medical or hospital charges for my child participant. I/we take responsibility for any and all medical needs throughout their entire 6-week participation in FSI and will provide personal insurance information upon acceptance into the program.

**Signature of Parent/Guardian:** __________________________ **Date:** __________________________

(For online submission without an electronic signature, please mail page 4 to FSI with appropriate signatures)

<table>
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<tr>
<th>Mother/Guardian #1</th>
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Mailing address

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Mailing address (if different)

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<th>City</th>
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Employer: __________________________

Employer: __________________________

Family income (required): ___ up to $49,999 ___ $50,000-$99,999 ___ $100,000-$199,999 ___ $200K+

Address any questions regarding the 2018 program or this application to:

Lori K. Ball, Director
Daytime phone: 970.351.2976 Evening phone: 970.396.9650
E-mail address: lori.ball@unco.edu
Web address: www.fsiunc.org
Frontiers of Science Institute Recommendation Request

___________ is applying for admission to the Frontiers of Science Institute. We would appreciate your comments on this student’s potential to successfully complete a six-week summer, residential, hands-on STEM (science, technology, engineering & mathematics) program. Some information helpful for our evaluation includes:

• number of years you have known the student
• ability to work independently or unsupervised
• self-motivation and attitude
• ability to work in a group
• interest level in STEM subjects
• academic ability/laboratory experience
• description of any completed science projects or programming experience

Thank you for your help.

Applicant: Please detach and give to your science/technology/mathematics teacher.

***Frontiers of Science Institute Recommendation Request***

___________ is applying for admission to the Frontiers of Science Institute. We would appreciate your comments on this student’s potential to successfully complete a six-week summer, residential, hands-on STEM (science, technology, engineering, mathematics) program. Some information helpful for our evaluation includes:

• number of years you have known the student
• ability to work independently or unsupervised
• self-motivation and attitude
• ability to work in a group
• interest level in STEM subjects
• academic and writing ability
• description of any lengthy writing assignments completed by the student

Thank you for your help.

Applicant: Please detach and give to your English teacher.

***Frontiers of Science Institute Recommendation Request***

___________ is applying for admission to the Frontiers of Science Institute. We would appreciate your comments on this student’s potential to successfully complete a six-week summer, residential, hands-on STEM (science, technology, engineering & mathematics) program. Some information helpful for our evaluation includes:

• number of years you have known the student
• ability to work independently or unsupervised
• self-motivation and attitude
• ability to work in a group
• interest level in STEM subjects
• academic ability
• confidence, social skills, assertiveness, ability to live away from home

Thank you for your help.

Applicant: Please detach and give to your counselor.
• Increase students' understanding of methods of STEM research and provide opportunities to apply those methods in their own investigations.

• Highlight a personal academic pathway for students to realize their highest potential.

• Challenge students through opportunities for critical thinking based on personal experiences and enhance their understanding of the societal impact of STEM progress.

• Build students' understanding of and appreciation for natural resources and diverse environments relation to technology, science, and society.

• Cultivate students' passion for STEM and encourage pursuit of higher education and careers in STEM.

FSI PROGRAM STRUCTURE

FSI’s instructional approach is different than that found in most high school classes. The FSI curriculum consists of daily blocks (~105 min each) involving either single discipline instruction or interdisciplinary team teaching, depending on STEM topics considered. Class blocks focusing on STEM usually involve combinations of discussions and laboratory activities emphasizing current topics within each of FSI’s listed areas of study. On-campus studies are integrated with fieldwork and tours of industrial, government, or institutional research and production facilities along Colorado’s Front Range.

Another component of FSI’s varied approach to learning is a series of overnight field trips to the region's representative environmental zones, from South Dakota’s Black Hills to the prairies to the Rocky Mountain tundra. A goal of FSI is to extend beyond the scope of high school science curricula and thus explore new, exciting frontiers of science.

FSI students are also engaged in mentored research where they are matched with a mentor to complete a focused STEM research project. Most projects fall within the scope of a mentor’s current work; students are pre-assigned to a project by the program director according to the interests listed on their application. Every effort is made to match a student with a project that most closely meets their research, higher education, and career interests. However, a perfect match cannot be guaranteed. The intent of the research is that FSI students learn to design experiments, collect and analyze data, and write a scientific research paper, thus building understanding of how mathematics and written and oral communications are used to interpret and report research. Students will also prepare posters for display, design multi-media presentations, develop a website, and communicate their research findings and conclusions during formal talks and informal discussions to their peers, faculty, parents, UNCO community and FSI sponsors. Through this experience, FSI students learn skills that are valued in business and industry and build contacts for summer internships, as well as future employment opportunities.

Every effort is made to expose FSI students to industrial researchers, professionals in STEM fields, science/mathematics faculty at UNCO, as well as experts from nearby universities. These experts from industry and the STEM community conduct think-tank seminars in many areas. Such interactions clarify current research projects, demonstrate how STEM professionals think and work, and offer insight into STEM related careers. Seminars are offered on topics concerning the relationship of STEM knowledge and research to societal problems and philosophical questions.

Important Note: Each student will participate in all program activities (camping trip(s), evening seminars, industrial/educational visits, research, all STEM classes, formal presentations, and the Open House Poster Session). Therefore, FSI students should be open to broaden their interests and explore all areas of STEM. No early program dismissal will be allowed.
UNCO CAMPUS LIFE

Approximately 30-40 students will live in an air-conditioned campus residence hall that is reserved for FSI’s exclusive summer use. All students will be assigned an FSI roommate, share meals in campus dining halls, and work in classrooms and laboratories within UNCO’s Ross Hall located within a short walking distance of the dormitory. Resident advisors will plan varied evening and weekend activities according to student interests; e.g., recreation center swim and gym, bowling, movies, shopping, hiking, etc.

Casual attire is acceptable during the normal class day; however, formal business-like attire is required on most industrial visits and during FSI’s Open House Poster Session. More detailed information regarding what to bring will be mailed to each participant upon admittance into the program.

EVALUATION

All students’ efforts are evaluated at FSI’s conclusion as instructors jointly prepare and write descriptive evaluations. These are retained on file and sent out at the request of each student. Many students ask that these evaluations serve as letters of recommendation for college admission &/or scholarship application.

UNCO COLLEGE CREDIT (optional)

FSI students may earn four UNCO (transferable) college credits upon completion of the full six-week program. A tuition fee of ~$240 payable directly to UNCO (NOT FSI) will be required of each student who opts to participate in the program for college credit. Students will receive letter grades based on their overall effort (classroom and laboratory participation, research paper, multi-media presentation, poster & website design).

SUPPLEMENTAL UNCO SCHOLARSHIP

In recent years, UNCO has provided an FSI scholarship of $15,000 annually for the FSI Director to distribute among FSI alumni who select UNCO for their higher education. Year and major of study, as well as total number of eligible FSI alumni will determine individual awards each year. Actual award amounts for FSI alumni will be determined at the beginning of each fall semester. Information about other UNCO scholarship programs can be found at www.unco.edu/ofa.

ADDITIONAL INFORMATION

FSI participants are expected to attend the entire six-week program. Students will not be admitted who plan to attend other programs that interrupt their six-week commitment to FSI. No early dismissal allowed.

FSI will award scholarships as they are confirmed by donors, and all students submitting an application should be notified of their status by mid-May. Though most, but not all scholarships are confirmed by this time, FSI will continue to award scholarships as they are confirmed into June.

Students selected to attend the 2018 Frontiers of Science Institute are expected to arrive at UNCO on Sunday afternoon, June 17th; classes and research commence on Monday, June 18th. Arrival information and other details will be mailed upon formal admission to the Institute.

SUBMIT APPLICATIONS AND ADDRESS ANY QUESTIONS ABOUT FSI TO:

Lori K. Ball, Director
Frontiers of Science Institute (FSI) - University of Northern Colorado
501 20TH Street – CB 123, Greeley, CO 80639
Daytime phone: 970.351.2976; Cell phone: 970.396.9650
E-Mail address: lori.ball@unco.edu; Website: www.fsiunc.org

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