

Science Undergraduate Laboratory Internships (SULI)

Summer 2022 - Application for: Samuel Minier

APPLICANT PROFILE

General Applicant Information

First Name: Samuel

Middle Name:

Last Name: Minier

Previous Last Name(s):

Primary Email Address: samminier@gmail.com

Alternate Email Address 1: smini001@odu.edu

Alternate Email Address 2:

ORCID: [0000-0001-5855-3976](https://orcid.org/0000-0001-5855-3976)

Current Address

Primary Phone Number: 618-975-3989

Alternate Phone Number: 618-975-3989

Citizenship/Languages/Eligibility Information

I will be 18 years of age or older by the time the internship begins: Yes

Are you a U.S. Citizen? Yes

Science Undergraduate Laboratory Internships (SULI)

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EDUCATIONAL BACKGROUND

Academic Information

Are you currently attending a community college or 2-year college?

No

Current academic status:

Senior

If you are selected as a participant in this DOE program, will you receive academic credit from your university/college for participating?

No

Science Undergraduate Laboratory Internships (SULI)

Summer 2022 - Application for: Samuel Minier

Undergraduate Institution Information

College/University Country:	United States and U.S. Territories
College/University State/Province/Territory:	Virginia
College/University Name:	Old Dominion University
College/University Address:	5115 Hampton Blvd
College/University City:	Norfolk
College/University Zip Code:	23529-1000
Expected/Declared Major:	Physical Sciences - Physics
Minor and/or Concentration Expected/Declared:	Mathematics
Expected Degree From This College/University:	Bachelor's
Expected/Completed Graduation Date:	May / 2022
Transcript:	Academic_Transcript_fall_2021.pdf
Does this institution provide grades?	Yes
GPA Scale:	4.0
Total Attempted Credits:	51.00
Total Earned Credits:	51.00
Total Quality Points:	164.90
GPA:	3.23

College/University Country:	United States and U.S. Territories
College/University State/Province/Territory:	Iowa
College/University Name:	Iowa State University
College/University Address:	2433 Union Dr
College/University City:	Ames
College/University Zip Code:	50011-0002
Expected/Declared Major:	Physical Sciences - Physics
Expected Degree From This College/University:	None (transfer credit earned)
Expected/Completed Graduation Date:	N/A
Transcript:	ISU_Spring_2020.pdf
Does this institution provide grades?	Yes
GPA Scale:	4.0
Total Attempted Credits:	59.00
Total Earned Credits:	56.00
Total Quality Points:	153.05
GPA:	2.73

Science Undergraduate Laboratory Internships (SULI)

Summer 2022 - Application for: Samuel Minier

College/University Country:	United States and U.S. Territories
College/University State/Province/Territory:	Illinois
College/University Name:	Lewis and Clark Community College
College/University Address:	5800 Godfrey Rd
College/University City:	Godfrey
College/University Zip Code:	62035-2466
Expected/Declared Major:	Undeclared
Expected Degree From This College/University:	None (transfer credit earned)
Expected/Completed Graduation Date:	N/A
Transcript:	LCCC.pdf
Does this institution provide grades?	Yes
GPA Scale:	4.0
Total Attempted Credits:	12.00
Total Earned Credits:	12.00
Total Quality Points:	48.00
GPA:	4.00
Overall Cumulative GPA:	3.08
Science, Technology, Engineering and Mathematics (STEM) Courses	
Course Title:	INTERMED QUANTUM MECHANICS
Course Number:	456
Enrollment Status:	Currently Enrolled
Course Title:	Partial Differential Equations
Course Number:	401
Enrollment Status:	Currently Enrolled
Awards or Honors	
Award Title:	Eagle Scout
Month & Year Received:	May / 2017
Awarding Institution:	The Boy Scouts of America
High School Graduation or GED	
Date of High School Graduation or GED:	May / 2018
Country:	United States
City:	Alton
State/Province/Territory:	IL

Science Undergraduate Laboratory Internships (SULI)

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WORK EXPERIENCE & SKILLS

Work Experience

Name of Place of Employment or Activity:	Ames National Lab
Dates of Employment or Activity:	From 1/17/2019 To 8/3/2020
Hours Per Week:	10.0
Primary Duties:	I was responsible for preparing samples, quality control of samples, performing the planned experiment , and analyzing the data that was collected.
Tasks Performed:	Prepared gold nanoparticles by coating them in PolyN-isopropylacrylamide (PNIPAM). Tested the quality of the PNIPAM sample with dynamic light scattering, and ultraviolet-visible spectroscopy. Used a liquid surface x-ray device to gather Grazing-Incidence Small-Angle X-ray Scattering (GISAXS) data and X-ray Reflectivity (XR) data. Analyzed GISAXS and XR data with python.

Professional Associations

Are you a member of any professional organizations?	No
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Computer Skills

Computer related skills:	While I was employed at Ames lab, 1/17/2019 to 8/3/2020, I was taught how to program in Python. With this skill, I developed programs to analyze the data from the experiments we performed. Then this past semester, fall 2021, I took a course on computational physics. The course used Python to solve and simulate physics problems with different techniques and methods.
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Laboratory/Technical Skills

Experience with advanced laboratory techniques or equipment:	I have experience developing Standard Operating Procedures for preparing consistent nanoparticle samples. I have operated Dynamic Light Scattering and Ultraviolet-Visible Spectroscopy instruments to examine samples. I have operated a Liquid Surface X-ray Scattering machine to collect X-ray Reflectivity and Grazing-Incidence Small-Angle X-ray Scattering data.
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Science Undergraduate Laboratory Internships (SULI)

Summer 2022 - Application for: Samuel Minier

PROGRAM INFORMATION

Eligibility

Have you previously participated in 2 SULI appointments? No

Previous DOE Internship/Fellowship or Lab Activity Experience

Have you ever had an internship/fellowship with the Department of Energy or any of its National Laboratories (such as SULI, CCI, VFP) or attended an activity at one of the National Laboratories (such as a Mini-Semester or Sustainable Research Pathways)? No

Availability

What is the earliest date you can begin your internship? 6/5/2022

When do you need to complete your internship? 8/14/2022

First Choice Host DOE Laboratory

DOE Laboratory: Thomas Jefferson National Accelerator Facility (TJNAF)

First Choice Research Area: Accelerator Physics/Science

Second Choice Research Area: Nuclear Physics

Third Choice Research Area: Nuclear Science

Second Choice Host DOE Laboratory

DOE Laboratory: Idaho National Laboratory (INL)

First Choice Research Area: Engineering Nuclear

Second Choice Research Area: Nuclear Science

Third Choice Research Area: Nanotechnology

Relatives Employed at DOE Laboratories

Are you a relative of an employee at the proposed host DOE laboratories? No

Science Undergraduate Laboratory Internships (SULI)

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ESSAYS

Research Experience:	I have been fortunate to have participated in two different research groups as an undergraduate student thus far. I spent a little over a year and a half working as a Lab Assistant at Ames National Lab. Typically I would work alongside a SULI student and on occasion a graduate student as well. Our mentor gave us lots of autonomy while we worked in the lab, where we would be given weekly goals and objectives. From there, we would be free to work towards these goals on our own and would present our findings and progress intermittently throughout the week. This approach I found incredibly rewarding in that it forced us to develop critical thinking skills so we could meet our objectives.
Research Interests:	<p>I chose Thomas Jefferson National Lab as my first choice for several reasons. Firstly, since I am a physics student at Old Dominion University, I have had many professors who are currently conducting research at the facility. Through these courses they have taught, I have developed an interest in the research they are conducting into atomic and nuclear physics. Along with this, I am currently working on my senior thesis which is building off a Nuclear Physics experiment that was conducted there around two years ago. So, I would love to have the opportunity to work on similar experiments that are happening now. Which would allow me to build on the current knowledge I have gained from my courses and my senior thesis.</p> <p>I choose Idaho National Laboratory as my second choice because of their premier research into nuclear energy production. I personally believe that nuclear energy will be pivotal in the years to come to meet energy demands as they are needed. With climate change concerns rising and as we look for greener forms of energy production, I think and the data support that nuclear energy is the best way forward.</p>
Personal Experience:	I had the pleasure of working alongside a SULI student before, which allowed me insight into the hard work dedication which is required to be successful in the program. This along with my previous experience conducting research I believe that I will bring skills to the table which will allow me to be successful in the SULI program. Also, by the time the program starts I will have just graduated with my bachelor's degree in physics. This provides a wide basis of scientific understanding that I pull from especially with the higher-level courses I have taken like quantum mechanics, electrodynamics, and accelerator physics.
Professional Goals:	Once I complete my physics undergraduate degree in the spring semester of 2022, I hope to pursue a graduate degree in either Medical Physics or Nuclear Engineering. Both of these fields are unique in how they can help advance civilization as a whole. As of now, nuclear power could be the most important form of energy production for meeting the rising power demands in a cheap, clean, efficient, and most importantly safe manner. As for my interest in Medical Physics, the enhancements in therapies and imaging capabilities being developed are not only exciting but also impactful for treating patients. Medical Physics uniquely combines elements of nuclear physics that can impact people on an individual basis. I believe more understanding from an opportunity like this will only embolden my desire to pursue these scientific paths.

RECOMMENDATIONS

Recommendation 1:	First Name: Sebastian Last Name: Kuhn Email: skuhn@odu.edu Status: Received 12/31/2021
Recommendation 2:	First Name: David Last Name: Vaknin Email: vaknin@ameslab.gov Status: Received 1/6/2022
Recommendation 3:	First Name: Wenjie Last Name: Wang Email: wenjiew@ameslab.gov Status: Received 1/11/2022

IOWA STATE UNIVERSITY

Unofficial Transcript**Iowa State University****Current Student Information**

MINIER SAM C

Curr/Major: PHYS**College:** Liberal Arts and Sciences**Unofficial Undergraduate Transcript****Iowa State University****FALL 2018 SEMESTER**

TRANSFER CREDITS ACCEPTED FROM
LEWIS AND CLARK COMMUNITY COLLEGE
YEARS OF ATTENDANCE: 2016-2018

ART H 280	3.0
ECON 102	3.0
ENGL 150	3.0
ENGL 250	3.0

TOTAL TRANSFER CREDITS 12.00

ADMITTED AS A FRESHMAN

ADMITTED TO DEGREE PROGRAM IN PHYS

FALL 2018

ASTRO 150	STARS, GALAXIES & COSM	3.0	B-
CHEM 177	GENERAL CHEMISTRY I	4.0	B-
CHEM 177L	LAB GENERAL CHEM I	1.0	B
LIB 160	INFORMATN LITERACY	1.0	S
MATH 165	CALCULUS I	4.0	B
PHIL 230	MORAL THEOR&PRCTICE	3.0	B
PHYS 199	INTRODUCTRY SEMINAR	R	S

		Cred Hrs	Qpts	GPA	Trnsf Hrs
TERM:		15.0	42.69	2.85	12.00
CUM:TOT HRS	28.0	15.0	42.69	2.85	12.00

SPRING 2019 SEMESTER

HD FS 239	CONSUMER ISSUES	3.0	B-
MATH 166	CALCULUS II	4.0	C
MATH 201	INTRO TO PROOFS	3.0	X
MUSIC 102	INTRO MUSIC LISTENI	3.0	C+ R
PHYS 221	INTR CLASSCL PHYS I	5.0	B-

		Cred Hrs	Qpts	GPA	Trnsf Hrs
TERM:		15.0	36.35	2.42	0.00
CUM:TOT HRS	43.0	30.0	79.04	2.63	12.00

FALL 2019 SEMESTER

TRANSFER CREDITS ACCEPTED FROM
IOWA WESTERN COMMUNITY COLLEGE (IWCC)
DATE OF ATTENDANCE: SUMMER 2019

PHYS 222	5.0
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TOTAL TRANSFER CREDITS 5.00

FRNCH 101	ELEMENTARY FRENCH I	4.0	D+
MATH 265	CALCULUS III	4.0	B-
MATH 267	DIFF EQ & TRANSFMS	4.0	C
PHYS 321	INTR MODRN PHYSICS I	3.0	B-
PHYS 321L	INTR MOD PHYS LAB I	1.0	B+

		Cred Hrs	Qpts	GPA	Trnsf Hrs
TERM:		16.0	35.34	2.21	5.00
CUM:TOT HRS	64.0	46.0	114.38	2.49	17.00

SPRING 2020 SEMESTER

MATH 207	MATRCES&LINEAR ALGB	3.0	P <
MUSIC 102	INTRO MUSIC LISTENI	3.0	A #
PHIL 485	PHILOSOPH OF PHYSICS	3.0	A-
PHYS 322	INTR MODERN PHYS II	3.0	B+
PHYS 322L	INTR MOD PHY LAB II	1.0	B-
PHYS 361	CLASSICAL MECHANICS	3.0	B+

		Cred Hrs	Qpts	GPA	Trnsf Hrs
TERM:		13.0	45.66	3.51	0.00
CUM:TOT HRS	77.0	56.0	153.05	2.73	17.00

Cumulative Summary

77.0	56.0	153.05	2.73
TOTAL HRS	ISU CUM HRS	ISU CUM QPTS	ISU CUM GPA

End of Unofficial Undergraduate Transcript

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Unofficial Transcript**Iowa State University**

Date Displayed December 29, 2021 15:05 PM

***** END OF RECORD *****

EXPLANATION OF SPECIAL SYMBOLS:

- R - GRADE SUPERSEDED BY A LATER GRADE
- # - COURSE REPEATED
ONLY THE MOST RECENT GRADE USED IN CUMULATIVE TOTALS
- < - COURSE TAKEN UNDER PASS-NOT PASS OPTION
- * - GRADE FOR PREVIOUS INCOMPLETE
NOT INCLUDED IN TERM TOTALS
- H - HONORS COURSE
- N - GRADE NOT YET REPORTED

UNOFFICIAL TRANSCRIPT

Iowa State University

NAME: Minier, Samuel
STUDENT #: 0186706 BIRTHDATE: 05/06
PRINT DATE: January 11 2022

PAGE: 1 of 1

ISSUED TO: Samuel Minier
1732 Seminole
Godfrey IL 62035


COURSE GRD	PTS	Course Title	ATT	ERN	GRD	PTS	COURSE	Course Title	ATT	ERN
2016 FALL (08/22/2016 to 12/15/2016)										
ECON-151		MACROECONOMICS	3.00	3.00	A	12.00				
		Semester GPA 4.000	3.00	3.00		12.00				
		Cumulative GPA 4.000	3.00	3.00		12.00				
2017 FALL (08/21/2017 to 12/14/2017)										
ENGL-131		FIRST-YEAR ENGLISH I	3.00	3.00	A	12.00				
		Semester GPA 4.000	3.00	3.00		12.00				
		Cumulative GPA 4.000	6.00	6.00		24.00				
2018 SPRING (01/16/2018 to 05/11/2018)										
ART-141		HISTORY OF ART I	3.00	3.00	A	12.00				
ENGL-132		FIRST-YEAR ENGLISH II	3.00	3.00	A	12.00				
		Semester GPA 4.000	6.00	6.00		24.00				
		Cumulative GPA 4.000	12.00	12.00		48.00				

End of official record.



SAMUEL MINIER
Dec 29, 2021 03:22 pm

Display Transcript

 This is NOT an official transcript. Unofficial transcripts are for personal use only. Courses which are in progress may also be included on this transcript.

[Transfer Credit](#) [Old Dominion University Credit](#) [Transcript Totals](#) [Courses in Progress](#)

Transcript Data

STUDENT INFORMATION

Name : SAMUEL MINIER

Curriculum Information

Current Program

Major and Department: Physics, Physics

Major Concentration: Physics-Option A

Minor: Mathematics

This is NOT an Official Transcript

AWARDED:

Application Accepted: Bachelor of Science Degree Date:

Curriculum Information

Primary

Major: Physics

Major Concentration: Physics-Option A

Minor: Mathematics

TRANSFER CREDIT ACCEPTED BY INSTITUTION -Top-

FA16-SP18: LEWIS CLARK CMTY COLLEGE

Subject	Course	Title		Grade	Credit Hours	Quality Points		R
ARTH	1ELE	ELECTIVE		TP	3.000			0.00
ECON	201S	PRINCIPLES OF MACROECONOMICS		TP	3.000			0.00
ENGL	110C	ENGLISH COMPOSITION		TP	3.000			0.00
ENGL	211C	ENGLISH COMPOSITION		TP	3.000			0.00
		Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA	
Current Term:		12.000	0.000	12.000	0.000	0.00		0.00

Unofficial Transcript

SU19-SU19: IOWA WESTERN CC COUNCIL BLUFFS

Subject	Course	Title		Grade	Credit Hours	Quality Points		R
PHYS	232N	UNIVERSITY PHYSICS II		TP	5.000			0.00
		Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA	
Current Term:		5.000	0.000	5.000	0.000	0.00		0.00

Unofficial Transcript

FA18-SP20: IOWA STATE UNIVERSITY

Subject	Course	Title	Grade	Credit Hours	Quality Points	R
CHEM	121N	FOUNDATIONS OF CHEM I LECTURE	TP	4.000		0.00
CHEM	122N	FOUNDATIONS OF CHEM I LAB	TP	1.000		0.00
GNRL	2ELE	ELECTIVE	TP	3.000		0.00
MATH	211	CALCULUS I	TP	4.000		0.00
MATH	212	CALCULUS II	TP	4.000		0.00
MATH	2ELE	ELECTIVE	TP	4.000		0.00
MATH	2ELE	ELECTIVE	TP	3.000		0.00

MATH	312	CALCULUS III	TP	4.000	0.00
MUSC	1ELE	ELECTIVE	TP	3.000	0.00
PHIL	4ELE	ELECTIVE	TP	3.000	0.00
PHYS	1ELE	ELECTIVE	TP	3.000	0.00
PHYS	231N	UNIVERSITY PHYSICS	TP	5.000	0.00
PHYS	3ELE	ELECTIVE	TP	3.000	0.00
PHYS	3ELE	ELECTIVE	TP	3.000	0.00
PHYS	3ELE	ELECTIVE	TP	1.000	0.00
PHYS	3ELE	ELECTIVE	TP	3.000	0.00
PHYS	3ELE	ELECTIVE	TP	1.000	0.00
PL	1REQ	PHILOSOPHY (LOWER-DIV REQ)	TP	3.000	0.00

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	55.000	0.000	55.000	0.000	0.00	0.00

Unofficial Transcript

OLD DOMINION UNIVERSITY CREDIT [-Top-](#)

Term: Fall 2020

Academic Standing: Good Academic Standing

Additional Standing: Dean's List

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	Start and End Dates	R
COMM	112R	UG	INTRO-INTERPERS COMMUNICATION	A	3.000	12.00		
FR	101F	UG	BEGINNING FRENCH I	B+	3.000	9.90		
HIST	104H	UG	INTERPRETING THE AMERICAN PAST	A-	3.000	11.10		
PHYS	355	UG	MATH METHODS OF PHYSICS	B-	3.000	8.10		
PHYS	425	UG	ELECTROMAGNETISM I	B	3.000	9.00		
WCS	100L	UG	INTRO TO WORLD LIT & CULTURES	A	3.000	12.00		

Term Totals (Undergraduate)

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	18.000	18.000	18.000	18.000	62.10	3.45
Cumulative:	18.000	18.000	18.000	18.000	62.10	3.45

Unofficial Transcript

Term: Spring 2021

Academic Standing: Good Academic Standing

Additional Standing: Dean's List

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	Start and End Dates	R
CS	150	UG	PROBLEM SOLVING & PRGMNG I	A	4.000	16.00		
FR	102F	UG	BEGINNING FRENCH II	B	3.000	9.00		
PHYS	417	UG	INTRO TO ACCELERATOR PHYSICS	A-	3.000	11.10		
PHYS	453	UG	ELECTROMAGNETISM II	B-	3.000	8.10		
PHYS	454	UG	THERMAL & STATISTICAL PHYSICS	B+	3.000	9.90		

Term Totals (Undergraduate)

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	16.000	54.10	3.38
Cumulative:	34.000	34.000	34.000	34.000	116.20	3.41

Unofficial Transcript

Term: Fall 2021

Academic Standing: Good Academic Standing

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	Start and End Dates	R
CHEM	123N	UG	FOUNDATIONS OF CHEM II LECTURE	B-	3.000	8.10		
CHEM	124N	UG	FOUNDATIONS OF CHEM II LAB	B-	1.000	2.70		
MATH	317	UG	CALCULUS IV: INTRO ANALYSIS	C	3.000	6.00		
PHYS	303	UG	INTERMED EXPERIMENTAL PHYSICS	A	3.000	12.00		
PHYS	420	UG	INTRO COMPUTATIONAL PHYSICS	B+	3.000	9.90		
PHYS	452	UG	INTRO TO QUANTUM MECHANICS	C	3.000	6.00		
PHYS	489W	UG	SENIOR THESIS I	A	1.000	4.00		

Term Totals (Undergraduate)

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	17.000	17.000	17.000	17.000	48.70	2.86
Cumulative:	51.000	51.000	51.000	51.000	164.90	3.23

Unofficial Transcript

TRANSCRIPT TOTALS (UNDERGRADUATE) [-Top-](#)

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Overall:	123.000	51.000	123.000	51.000	164.90	3.23

Unofficial Transcript

COURSES IN PROGRESS [-Top-](#)**Term: Spring 2022**

Subject	Course	Level	Title	Credit Hours	Start and End Dates
ASTP	495	UG	TPCS: SPECT OF ATMOSPHERES	3.000	
MATH	401	UG	Partial Differential Equations	3.000	
PHYS	309	UG	Physics on the Back of an Envelope	1.000	
PHYS	456	UG	Intermediate Quantum Mechanics	3.000	
PHYS	490W	UG	Senior Thesis II	2.000	
POLS	350T	UG	Technology and War	3.000	

Unofficial Transcript

RELEASE: 8.7.1

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SULI PROGRAM APPLICATION RECOMMENDATION FOR SAMUEL MINIER

Recommender Contact Information

- **First Name:** Sebastian E.
- **Last Name:** Kuhn
- **Title:** Professor
- **Department:** Physics
- **Institution/Organization:** Old Dominion University
- **Telephone:** 757-683-5804
- **Email:** skuhn@odu.edu

Applicant Information

Association

Describe your relationship to the applicant, including how long you've known the applicant, where, and in what capacity.

I have known Mr. Minier since the Spring of 2021, when he came to me looking for a research project in my group at ODU. After getting to know him a little, I was immediately convinced that he would make an outstanding undergraduate researcher in the lab, and he hasn't disappointed me. Over the summer, we mostly worked on getting him up to speed on the technical and physics knowledge he would need for the very demanding project I had in mind for him. Mr. Minier then began his involvement in this project in Fall of 2021, as part of a formal two-semester capstone course we require of all Physics B.S. students (Senior Thesis, PHYS499-490W). This course requires the students to become familiar with a research project, contribute their own, original work to it, and then present their results in a written thesis as well as an oral presentation (as part of the Physics Department colloquium). I am the chair of his thesis committee and have been supervising his work in the lab.

Applicant Comments

Please provide substantive comments about the applicant's education, training, aptitude, or promise relevant to the SULI program. Include any relevant additional detail or perspective regarding the applicant's research experience or equivalent experience on complex projects, including the level of independence or other factors that would contribute to the applicant's ability to make an excellent contribution to the SULI program.

The project Mr. Minier is working on is the characterization of the operational parameters of a cutting-edge detector, a Radial Time Projection Chamber (RTPC) which our group has built together with physicists and engineers at Hampton University and Jefferson Lab, to conduct a high-profile experiment at the latter. We successfully conducted this experiment (the so-called "BONuS12" experiment or Run Group F in Hall B) in 2020, under severe constraints due to the pandemic. Because of these constraints, we had to skip some of the planned calibration procedures before removing the detector from Jefferson Lab and bringing it to ODU. We set it up in our own Nuclear and Particle Physics Research Facility, including a complement of the state-of-the-art data acquisition electronics, with the goal of operating it under a wide range of conditions, to study the influence of gas composition and high voltage settings on the performance of the RTPC. This project required setting up the gas flow and high voltage for the detector, monitoring all operational parameters, setting up a cosmic ray trigger, and then running the data acquisition system to record cosmic ray events with tracks inside the RTPC. The final step is then to analyze these data and compare them to expectations based on software packages like "GARFIELD++".

Mr. Minier immediately immersed himself in this project, coming to the lab every week (often for several hours and/or on different days), and keeping meticulous records of his work. He took part in all aspects of the experimental part of the project, even improving the calibration of our

gas flow meters to get more accurate values for the gas compositions we tried out. He was quick to learn the software required to run the experiments, and he plotted his results with minimal input from my side. He held his own in our group, often working at a level on par with a Ph.D. student. I can state without any reservation that he is among the top 5% of Senior Thesis students that I have either supervised or observed as member of their thesis committees. He has accomplished a lot more in just one semester than many other Senior Thesis students accomplish during the whole 2-semester course.

In the Winter/Spring of 2022, Mr. Minier will continue analyzing the data we took, with the goal of deriving quantitative relationships between the various operational parameters of the RTPC and the drift time and signal height observed. He will also complete a stand-alone “tracker” that will allow us to study the cosmic muon tracks inside the RTPC. I am confident that both his thesis and his presentation will be of very high quality. I should mention that, in addition to discussing our specific project, I find him always interested to talk about any topic related to Physics – his keen interest in all areas of our field is both genuine and inspiring.

Applicant Rating

In comparison to other undergraduate students, please rate the applicant relative to his/her peers on the following qualifications:

	Do Not Know	Below Average	Average	Above Average	Superior
Analytical and Mathematical				X	
Experimental Research					X
Overall Academic				X	
Initiative and Self Reliance					X
Motivation toward Scientific Career					X
Originality of Thought					X
Emotional Maturity					X
Ability to Work with Others					X
Potential for Leadership					X
Oral Communication Skills					X
Written Communication Skills	X				

SULI PROGRAM APPLICATION RECOMMENDATION FOR SAMUEL MINIER

Recommender Contact Information

- **First Name:** David
- **Last Name:** Vaknin
- **Title:** senior scientist
- **Department:** Ames Laboratory
- **Institution/Organization:** Ames Laboratory, Iowa State University
- **Telephone:** 515-294-6023
- **Email:** vaknin@ameslab.gov

Applicant Information

Association

Describe your relationship to the applicant, including how long you've known the applicant, where, and in what capacity.

Sam joined my group in Ames Laboratory at Iowa State University in May 2019 as a lab assistant and left on May 2020. Prior to this period, Sam tool

Applicant Comments

Please provide substantive comments about the applicant's education, training, aptitude, or promise relevant to the SULI program. Include any relevant additional detail or perspective regarding the applicant's research experience or equivalent experience on complex projects, including the level of independence or other factors that would contribute to the applicant's ability to make an excellent contribution to the SULI program.

I am writing this letter in support of Sam Minier as he applies for the SULI internship. Sam joined my group in Ames Laboratory at Iowa State Univer

Sam was assigned to assist in conducting X-ray scattering experiments from liquid surfaces and analyze the collected data. The project involved assembling gold nanoparticles (AuNPs) at liquid surfaces. Sam took all the safety training required for the work in the lab and thoroughly studied the standard operating procedures. Sam was involved in the grafting of AuNPs with the thermosensitive polymer PNIPAM, and then participated in sample characterization, with other students in the group, using UV-vis and dynamic light scattering (DLS) to ensure they were good samples. Sam participated in the preparation of two kinds of PNIPAM-AuNPs samples with PNIPAM of two molecular weights 3 kDa and 6kDa PNIPAM.

Sam then was assigned to analyze the X-ray data and to summarize the results. He learned how to use the Python programming language through Jupyter Notebook and modified programs for the analysis. After leaving the lab due to the Covid-19, he continued to remotely work on data analysis of the 3 and 6 kDa PNIPAM-AuNPs and provided a rough summary of the results including figures. In the process, he learnt how to create and manipulate publication-quality figures using both Python and Corel Draw. The results of this study have been published recently in a refereed journal, and Sam contribution was significant to earn him authorship on the paper.

Sam has the maturity and competence expected from an internship student, and projects a positive attitude to become a valuable member in a scientific effort. He is a very intelligent, gentle person and has outgoing personality, and, I have been very pleased with Sam's contributions and achievements. I am glad he joined my group. I therefore recommend he is accepted to the internship program in your institute.

Should you need any further information, please contact me.

Applicant Rating

In comparison to other undergraduate students, please rate the applicant relative to his/her peers on the following qualifications:

	Do Not Know	Below Average	Average	Above Average	Superior
Analytical and Mathematical				X	
Experimental Research			X		
Overall Academic	X				
Initiative and Self Reliance				X	
Motivation toward Scientific Career				X	
Originality of Thought	X				
Emotional Maturity					X
Ability to Work with Others					X
Potential for Leadership	X				
Oral Communication Skills			X		
Written Communication Skills			X		