

Science Undergraduate Laboratory Internships (SULI)

Summer 2022 - Application for: John Velkey

APPLICANT PROFILE

General Applicant Information

First Name: John

Middle Name:

Last Name: Velkey

Previous Last Name(s):

Primary Email Address: javelkey0@gmail.com

Alternate Email Address 1:

Alternate Email Address 2:

ORCID: [0000-0001-5156-7451](https://orcid.org/0000-0001-5156-7451)

Current Address

Primary Phone Number: 757-879-3641

Alternate Phone Number:

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

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EDUCATIONAL BACKGROUND

Academic Information

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

No

Current academic status:

Junior

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

No

Undergraduate Institution Information

College/University Country: United States and U.S. Territories

College/University State/Province/Territory:

Maryland

College/University Name: University of Maryland Baltimore County

College/University Address: 1000 Hilltop Circle

College/University City: Baltimore

College/University Zip Code: 21250-5394

Expected/Declared Major: Engineering - Chemical

Minor and/or Concentration Expected/Declared:

Mathematics

Expected Degree From This College/University:

Bachelor's

Expected/Completed Graduation Date:

December / 2023

Transcript:

Transcript_Redacted.pdf

Does this institution provide grades?

Yes

GPA Scale:

4.0

Total Attempted Credits:

73.00

Total Earned Credits:

66.00

Total Quality Points:

201.00

GPA:

3.05

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Science, Technology, Engineering and Mathematics (STEM) Courses

Course Title: Advanced Chemistry Lab

Course Number: 311L

Enrollment Status: Recently Completed

Course Title: Chemical Engineering Analysis

Course Number: 215

Enrollment Status: Recently Completed

Course Title: Physical Chemistry 1

Course Number: 300

Enrollment Status: Recently Completed

High School Graduation or GED

Date of High School Graduation or GED: June / 2019

Country: United States

City: Newport News

State/Province/Territory: VA

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WORK EXPERIENCE & SKILLS

Work Experience

Name of Place of Employment or Activity:	Newport News Shipbuilding
Dates of Employment or Activity:	From 6/10/2019 To 8/15/2019
Hours Per Week:	40.0
Primary Duties:	Develop signage and other visual communication strategies to implement 5S organizational strategies into sheet metal production areas.
Tasks Performed:	Outside of project-oriented work, performed routine office tasks, and assisted with data entry, and data compilation in Microsoft Excel.

Professional Associations

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

Computer related skills:	<ul style="list-style-type: none"> -Microsoft Excel, Word, PowerPoint -Experience using Python in academic lab settings -Experience using MATLAB in an academic context
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Laboratory/Technical Skills

Experience with advanced laboratory techniques or equipment:	<u>Techniques</u> <ul style="list-style-type: none"> - Experience making measurements with, and calibrating, Cannon-Fenske viscometers. -Experience making measurements, and performing necessary calculations, with constant volume calorimeters. -Experience measuring the temperature difference and coefficient associated with the Joule-Thomson effect for different gases, using a valve and porous plug experimental setup. -Experience with basic distillation techniques -Experience with TLC analysis of solvent mixtures.
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PROGRAM INFORMATION

Eligibility

Have you previously participated in 2
SULI appointments? No

Previous DOE Internship/Fellowship Experience

Have you ever had an
internship/fellowship with the
Department of Energy or any of its
National Laboratories? No

Availability

What is the earliest date you can
begin your internship? 5/27/2022

When do you need to complete your
internship? 8/29/2022

First Choice Host DOE Laboratory

DOE Laboratory: National Renewable Energy Laboratory (NREL)

First Choice Research Area: Engineering Chemical

Second Choice Research Area: Materials Sciences

Third Choice Research Area: Engineering Power

Second Choice Host DOE Laboratory

DOE Laboratory: Thomas Jefferson National Accelerator Facility (TJNAF)

First Choice Research Area: Engineering Chemical

Second Choice Research Area: Physical Chemistry

Third Choice Research Area: Mathematics

Relatives Employed at DOE Laboratories

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

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ESSAYS

Research Experience:	<p>I've had limited experience working in project teams outside of academic contexts. In 2019, I worked as an Industrial Engineering intern, and worked in a group of 4 interns on a project designing and implementing visual aids to 5S organizational strategies in steel plate fabrication shops. The project was a team project, and the four of us worked closely together in all aspects of the project. The internship program allowed for us to occasionally go to other departments, in order to gain exposure to different engineering fields, but for the most part we collaborated on a daily basis to work on the project.</p> <p>Beyond that internship, COVID has limited the availability of internship and research positions, and I haven't had many opportunities beyond that internship to work in research or project groups.</p>
Research Interests:	<p>I'm particularly interested in the work surrounding thin-film photovoltaics and other engineering challenges related to renewable energy done at the National Renewable Energy Laboratory, and in learning more about what chemical engineering in the field of renewable energy amounts to. I know that I want to work in the renewable energy field in some capacity after I complete my studies, but because of COVID and other factors, I haven't gained much experience or exposure to the field yet. I strongly believe in the importance of renewable energy sources as a means of protecting the natural world around this, and the opportunity to contribute to such work is something I'm very excited for. As I haven't had much professional experience in the fields of chemical engineering or renewable energy, I'm very excited about the learning process still, and every opportunity I can get to work in either or both fields is something I look forward to.</p> <p>I'm also interested with the ways that chemical engineering supports the work done at the Jefferson National Accelerator Laboratory. As a native of Newport News, JLab greatly influenced my interest in STEM from a young age. I've visited the facility before as a grade schooler, and the Lab's outreach programs were foundational in my interest in STEM. In a way, I want to learn more about the role chemical engineering plays in the facility's research, but also to contribute to something that was so important to me when I was younger is an exciting prospect.</p>
Personal Experience:	<p>I believe that my academic experience makes me a strong candidate for the SULI program, and that the "soft" skills I've developed as a student make me well-suited for a working environment such as NREL or the Jefferson Accelerator Facility. When I began college in the Fall of 2019, I was unfamiliar with the environment and rigor of a university education. I didn't know how to effectively study for difficult subjects, and I didn't understand the intensity I needed to approach my coursework with. The same was true for my second semester, and I finished my first full year of my degree with a GPA I wasn't proud of, and still had little idea about how to improve as a college student. My third semester was a similar story, with classes fully online. For much of 2020 and 2021, these "failures" weighed heavily on me, and I spent a lot of time doubting my ability, because I felt like I couldn't figure out how to improve myself academically, and I felt unqualified for any internship I applied for. In the spring of 2021, I talked about this issue with a close friend of mine. In talking about it, I realized that I was upset with myself not because I struggled as a student, but because I wasn't able to fix the same mistakes that led to me failing to meet my own expectations.</p> <p>From that discussion, I decided to change my focus to fixing those smaller mistakes. Instead addressing mistakes by allowing myself to mess up, but refusing to make the same mistake twice. Because of this, I retok classes I had nearly failed previously, now passing them, even well beyond the expectations I set for myself. I improved my study habits, and learned what a balanced study life meant for me. I still have a lot to do and learn to become better as a student, but I do feel proud of the progress I've made.</p> <p>All of that being said, I believe the adoption of this idea makes me well suited as a SULI candidate. I proposed NREL and JLab as my two potential locations, but I truly feel I could work in any environment. I feel little stress in unfamiliar academic and working environments, I'm comfortable with making mistakes and being wrong, and most importantly, I know I can learn from a mistake and not make it twice.</p>
Professional Goals:	<p>As it is now, I feel somewhat unbalanced in terms of my chemical engineering education. I've spent the past few years studying and improving myself as a student, but I haven't yet been able to gain any experience outside of a classroom or lab. Academically, I'm focusing on performing well through the rest of my undergraduate career, and considering pursuing a master's degree in either materials or nuclear engineering. My proudest achievement when I complete my undergraduate degree will be my improvement as a student, and that's my goal for the time being. Professionally, I want my work to have a positive impact on the world around me. For me the value of my work comes from the impact that work has, which is why I have such an interest in renewable energy research. It's difficult to declare specific professional goals, given my limited professional experience, but I want to do impactful work. What they be could change depending on what I find I'm skilled at, or what kind of work I excel at.</p> <p>I believe that more than being a resume filler, or a summer job, SULI is a way for me to access the professional world at the intersection of my academic studies and the work I want to contribute to. I think that exposure to the</p>

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professional world will help me learn the skills needed to navigate a professional environment, and provide insight on how I can be most impactful in the work that I do with my degree.

RECOMMENDATIONS

Recommendation 1: **First Name:** Neha
Last Name: Raikar
Email: nraikar@umbc.edu
Status: Received 1/11/2022

Recommendation 2: **First Name:** John
Last Name: Ormond
Email: pbj.ormond@gmail.com
Status: Received 1/11/2022

Name: John Velkey
Student ID: 4000184227
Birthdate: [REDACTED]
Student Address: 5700 Huntington Ave
 Newport News, VA 23607-2054
Print Date: 2022-01-05

Institution Info: University of Maryland Baltimore County
1000 Hilltop Circle
Baltimore, MD 21250

Test Credits

Fall 2019

Course		Description	Attempted	Earned	Grade	Points
BIOL	SLL	BIOL SL Lower Level Elective	4.000	4.000	T	0.000
BIOL	141	Foundations of Biology	4.000	4.000	T	0.000
ENGL	206	Intro Wld Lit & Hist	3.000	3.000	T	0.000
ENGL	210	Introduction To Lit	3.000	3.000	T	0.000
MATH	L	MATH Lower Level Elective	3.000	3.000	T	0.000
NON	TRANS	Course not accepted by UMBC	0.000	0.000	T	0.000
NON	TRANS	Course not accepted by UMBC	0.000	0.000	T	0.000
POLI	100	Amer Govt & Politics	3.000	3.000	T	0.000
PSYC	100	Intro To Psychology	3.000	3.000	T	0.000
TRAN	LOWS	Low Score	0.000	0.000	T	0.000
TRAN	LOWS	Low Score	0.000	0.000	T	0.000
TRAN	LOWS	Low Score	0.000	0.000	T	0.000
TRAN	LOWS	Low Score	0.000	0.000	T	0.000
TRAN	LOWS	Low Score	0.000	0.000	T	0.000
TRAN	LOWS	Low Score	0.000	0.000	T	0.000
TRAN	LOWS	Low Score	0.000	0.000	T	0.000
TRAN	LOWS	Low Score	0.000	0.000	T	0.000
TRAN	LOWS	Low Score	0.000	0.000	T	0.000
TRAN	LOWS	Low Score	0.000	0.000	T	0.000
Test Trans GPA:		0.000	Transfer Totals:	23.000	23.000	0.000

Beginning of Undergraduate Record

Fall 2019

Program: Undergraduate Degree
Plan: Pre-Chemical Engineering Major
Plan: Physics - BS Major

<u>Course</u>		<u>Description</u>	<u>Attempted</u>	<u>Earned</u>	<u>Grade</u>	<u>Points</u>
CHEM	101	Principles Of Chemistry I	4.000	4.000	C	8.000
ECON	101	Prin Of Microeconomics	3.000	3.000	B	9.000
ENES	101	Introduction to Engineering	3.000	3.000	B	9.000
ENGL	243	Currents In American Lit	3.000	3.000	B	9.000
Course Topic:		Passing in American Lit				
MATH	151	Calc & Analy Geomtry I	4.000	4.000	B	12.000

			<u>Attempted</u>	<u>Earned</u>	<u>GPA Units</u>	<u>Points</u>
UMBC Term GPA	2.765	Term Totals	17.000	17.000	17.000	47.000
Overall Term GPA	2.765	Comb Totals	40.000	40.000	17.000	47.000

Unofficial Transcript

Name: John Velkey
Student ID: 4000184227

UMBC Cum GPA	2.765	Cum Totals	17.000	17.000	17.000	47.000
Overall Cum GPA	2.765	Comb Totals	40.000	40.000	17.000	47.000

Spring 2020

Program: Undergraduate Degree
Plan: Pre-Chemical Engineering Major
Plan: Physics - BS Major

Course		Description	Attempted	Earned	Grade	Points
CHEM	102	Prin Of Chemistry II	4.000	4.000	P	0.000
CHEM	102L	Intro Chemistry Lab I	2.000	2.000	P	0.000
ENGL	100	Composition	3.000	3.000	B	9.000
MATH	152	Calc & Analy Geometry II	4.000	4.000	B	12.000
PHYS	121	Introductory Physics I	4.000	4.000	B	12.000

			Attempted	Earned	GPA Units	Points
UMBC Term GPA	3.000	Term Totals	17.000	17.000	11.000	33.000
Overall Term GPA	3.000	Comb Totals	17.000	17.000	11.000	33.000
UMBC Cum GPA	2.857	Cum Totals	34.000	34.000	28.000	80.000
Overall Cum GPA	2.857	Comb Totals	57.000	57.000	28.000	80.000

Fall 2020

Program: Undergraduate Degree
Plan: Pre-Chemical Engineering Major
Plan: Physics - BS Major

Course		Description	Attempted	Earned	Grade	Points
CHEM	351	Organic Chemistry I	3.000	3.000	C	6.000
ENCH	215	Chem Engineering Analy	3.000	0.000	D	0.000
Repeated:		Repeat - Exclude Repeat Date:				
MATH	251	Multivariable Calculus	4.000	4.000	A	16.000
PHYS	122	Introductory Physics II	4.000	0.000	D	0.000
Repeated:		Repeat - Exclude Repeat Date:				

			Attempted	Earned	GPA Units	Points
UMBC Term GPA	3.143	Term Totals	14.000	7.000	7.000	22.000
Overall Term GPA	3.143	Comb Totals	14.000	7.000	7.000	22.000
UMBC Cum GPA	2.914	Cum Totals	48.000	41.000	35.000	102.000
Overall Cum GPA	2.914	Comb Totals	71.000	64.000	35.000	102.000

Unofficial Transcript

Name: John Velkey
Student ID: 4000184227

Spring 2021

Program: Undergraduate Degree
Plan: Pre-Chemical Engineering Major
Plan: Physics - BS Major

Course	Description	Attempted	Earned	Grade	Points
CHEM 351L	Organic Chemistry Lab I	2.000	2.000	B	6.000
ENME 110	Statics	3.000	3.000	C	6.000
MATH 221	Introduction To Linear Algebra	3.000	3.000	B	9.000
MATH 225	Intro Differentl Equations	3.000	3.000	B	9.000
PHYS 122	Introductory Physics II	4.000	4.000	B	12.000
Repeated:	Repeat - Include Repeat Date:				

		Attempted	Earned	GPA Units	Points
UMBC Term GPA	2.800 Term Totals	15.000	15.000	15.000	42.000
Overall Term GPA	2.800 Comb Totals	15.000	15.000	15.000	42.000
UMBC Cum GPA	2.880 Cum Totals	63.000	56.000	50.000	144.000
Overall Cum GPA	2.880 Comb Totals	86.000	79.000	50.000	144.000

Summer 2021

Program: Undergraduate Degree
Plan: Pre-Chemical Engineering Major
Plan: Physics - BS Major

Course	Description	Attempted	Earned	Grade	Points
ENCH 215	Chem Engineering Analy	3.000	3.000	A	12.000
Repeated:	Repeat - Include Repeat Date:				

		Attempted	Earned	GPA Units	Points
UMBC Term GPA	4.000 Term Totals	3.000	3.000	3.000	12.000
Overall Term GPA	4.000 Comb Totals	3.000	3.000	3.000	12.000
UMBC Cum GPA	2.943 Cum Totals	66.000	59.000	53.000	156.000
Overall Cum GPA	2.943 Comb Totals	89.000	82.000	53.000	156.000

Fall 2021

Program: Undergraduate Degree
Plan: Chemical Engineering - BS Major
Plan: Physics - BS Major

Course	Description	Attempted	Earned	Grade	Points
ANTH 101	Intro to Anthropology	3.000	3.000	A	12.000
ART 324	History Of Film To 1965	3.000	3.000	B	9.000
CHEM 301	Physical Chemistry I	4.000	4.000	B	12.000
CHEM 311L	Advanced Lab I	3.000	3.000	A	12.000

Unofficial Transcript

Name: John Velkey
Student ID: 4000184227

			<u>Attempted</u>	<u>Earned</u>	<u>GPA Units</u>	<u>Points</u>
UMBC Term GPA	3.462	Term Totals	13.000	13.000	13.000	45.000
Overall Term GPA	3.462	Comb Totals	13.000	13.000	13.000	45.000
UMBC Cum GPA	3.045	Cum Totals	79.000	72.000	66.000	201.000
Overall Cum GPA	3.045	Comb Totals	102.000	95.000	66.000	201.000

Spring 2022

Program: Undergraduate Degree
Plan: Chemical Engineering - BS Major
Subplan: Traditional Track
Plan: Minor: Mathematics Minor

<u>Course</u>		<u>Description</u>	<u>Attempted</u>	<u>Earned</u>	<u>Grade</u>	<u>Points</u>
CHEM	302	Physical Chemistry II	3.000	0.000		0.000
CMSC	201	Computer Science I	4.000	0.000		0.000
MATH	301	Intro to Mathematic Analysis I	4.000	0.000		0.000

			<u>Attempted</u>	<u>Earned</u>	<u>GPA Units</u>	<u>Points</u>
UMBC Term GPA	0.000	Term Totals	11.000	0.000	0.000	0.000
Overall Term GPA	0.000	Comb Totals	11.000	0.000	0.000	0.000
UMBC Cum GPA	3.045	Cum Totals	90.000	72.000	66.000	201.000
Overall Cum GPA	3.045	Comb Totals	113.000	95.000	66.000	201.000
Undergraduate Career Totals						
UMBC Cum GPA:	3.045	Cum Totals	90.000	72.000	66.000	201.000
Overall Cum GPA	3.045	Comb Totals	113.000	95.000	66.000	201.000

End of Unofficial Transcript

SULI PROGRAM APPLICATION RECOMMENDATION FOR JOHN VELKEY

Recommender Contact Information

- **First Name:** John
- **Last Name:** Ormond
- **Title:** Scoutmaster
- **Department:** NA
- **Institution/Organization:** BSA Troop 3/Ship 37
- **Telephone:** 757-270-5149
- **Email:** pbj.ormond@gmail.com

Applicant Information

Association

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

I am John's Scoutmaster. I have watched him grow into one of the finest young men I know. John is excellent example of Boy Scouts of America. He has grown up in scouting from Cub Scouts to Boy Scouts to Sea Scouts and Venturing. His character has developed greatly over the last several years and he is distinguished from other Eagle scouts in my Troop.

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.

During John's membership in Troop 3, he has help with many projects for other Eagle scouts. He has participant with the troop in the past 7 year in supporting the Isle of Wight/Surry Relay for Life. Every June, our troop is the major work force behind the setup, running, and take down of the Relay for Life. As scouts, we cannot raise money directly for the relay, but we do help the event managers and teams setup & takedown the tents. Our biggest activity at the relay is the luminaires. Over a 6 hours, we label, fill, setup, light, and retrieve 2400 little bags of sand and candles to honor members of the community that have been taken by or survived cancer.

John has remained an active member & leader of our older scouts Venture Crew and Sea Scout Ship, even while attending college. He enjoys sailing, backpacking, and camping. Helping as a role model and assistant leader, John mentors the high school aged scouts in the planning and execution of projects and activities.

His combination of kindness and strength of character are attributes that I rarely see anymore. He is a fine example of what a Boy Scout should be. He would be an excellent selection your internship. There are few young men that I think of so highly.

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 JOHN VELKEY

Recommender Contact Information

- **First Name:** Neha
- **Last Name:** Raikar
- **Title:** Lecturer
- **Department:** Chemical, Biochemical, and Environmental Engineering
- **Institution/Organization:** University of Maryland Baltimore County, CBEE Dept
- **Telephone:** 413-687-5451
- **Email:** nraikar@umbc.edu

Applicant Information

Association

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

I am writing this letter to recommend John Velkey for the Science Undergraduate Laboratory Internships (SULI) program. I have known John for about two semesters now. He was in my Chemical Engineering Analysis (mass and energy balances) course during the summer, and currently, he is my academic advisee.

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.

John is highly diligent, motivated, and persistent. John not only received an A in the class but was also the top scorer on some exams. His ability to assimilate, understand and solve challenging mathematics and chemical engineering problems is impressive. John attended all the classes regularly. His questions in and out of class were very thoughtful, and it was evident that he tried to understand the material deeply. John can work independently as well as in groups.

Due to the pandemic and many courses being online as a result, John had a rough start. But he was resilient and bounced back strongly. I personally saw this when he took the summer course. Even though the 8-week class is hugely fast-paced, John was able to keep up and made sure to absorb the material well. John is interested in renewable energy, particularly in thin-film photovoltaics. John also has the ability to adapt to unfamiliar working environments quickly. His analytical skills, determination, and sheer desire to learn make him a strong candidate for the program.

John is also a good team player and works hard in team activities. John did a great job presenting the concepts of combustion involved in small engines for the class project. He spearheaded the project and took the initiative to finish the work on time despite having some group members not contributing enough. The group ranked John's role favorably in the peer-review survey for the

project. John's extroverted nature helps him adjust and fit it quickly. He is a fast learner and, as such, can be quickly trained.

In a nutshell, John is a highly motivated, brilliant student who will undoubtedly be an excellent fit for this program and will tremendously benefit from the program. Please do not hesitate to contact me for any further details.

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				