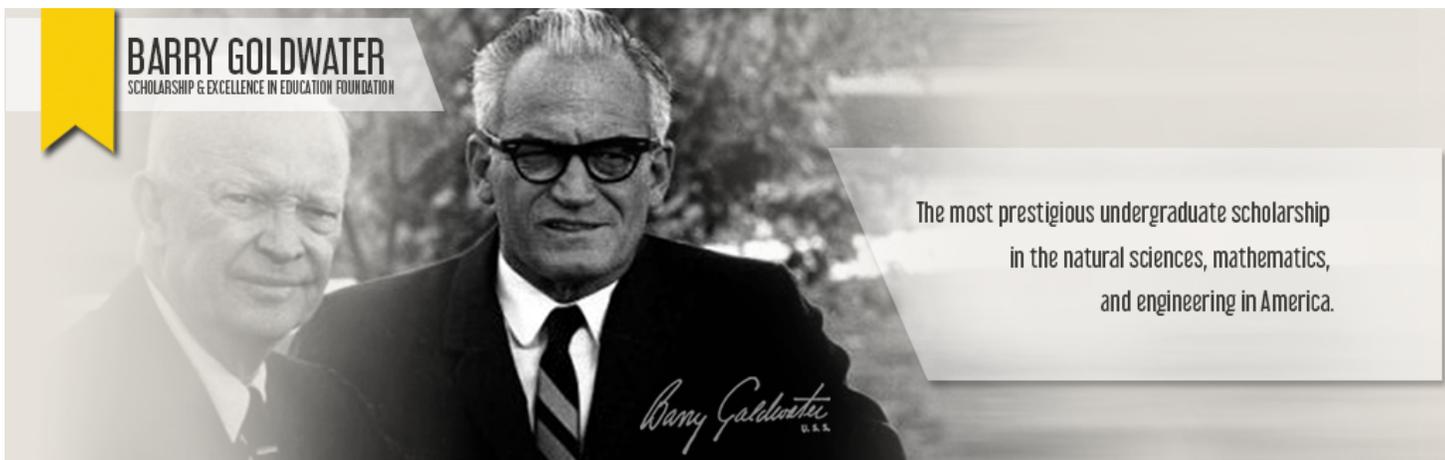Registration ID ▇▇▇▇
[Log Out](#)

The Barry Goldwater Scholarship and Excellence in Education Foundation

Application Review

Registration ID ▇▇▇▇
Your session will automatically time out at **8:50:18pm** Central Time if no action is taken. Any action (saving information or choosing a new page) will reset this timer.

Your application data has been submitted. No changes to your application can be made, however, you can update profile information at any time from the Student Overview screen.

Recommenders

Recommenders

Actions	Name *	Email *	Action Date	Buttons
███████	███████	███████	███████	███████

The recommender's list is currently locked. The submission window is closed.

This application requires 3 recommendations.

Making a change to the list of recommenders: Student applicants cannot make changes to the list of recommenders. Changes to the list must be made by the Campus Representative. For guidance on how to remove and replace a recommender, please see FAQ questions **"How is a letter writer replaced?"**

Application Questions & Answers

Legal Residence Information

Question	Answer
* Citizenship	████
* Legal Residence Address	
Address (line 2)	
* City	
* State	
* Zip Code	
* Your U.S. Congressional House District	

Career Goals/Professional Aspirations

Question	Answer
* What is the highest degree you plan to obtain?	Ph.D.
* In one or two sentences, describe your career goals and professional aspirations (see example below). This statement will be used in publications if you are selected as a scholar.	Ph.D. in Polymer Science. I intend to pursue an academic career at a research-driven university so that I can lead research efforts that contribute to the electrical performance of flexible materials.
* What are your career goals and professional aspirations? Indicate which area(s) of mathematics, science, or engineering you are considering pursuing in your research career and specify how your current academic program and your overall educational plans will assist you in achieving your career goals and professional aspirations.	After earning my Ph.D., I plan to pursue a career in academia as a research professor and principal investigator in the field of polymer electronics. It is my goal to operate my own laboratory while teaching and inspiring the next generation of researchers and scientists. With one of the best and most comprehensive polymer science and engineering programs in the country, the University of Southern Mississippi has been preparing me for this goal with training in polymer organic chemistry, polymer morphology, and rheology of polymeric materials. This rigorous plan of study, combined with my 20 hours per week in the laboratory working alongside graduate students, has helped me develop graduate-level skills such as x-ray scattering analysis, tensile testing, polymer synthesis, and academic manuscript preparation and has also encouraged my cooperation with researchers from different academic institutions and professional industries. Communicating with different academic and industrial professionals to explain test results has encouraged me to refine my own research approach, as well as to network within my field. Through the professional contacts I made via my research lab, I was able to secure an internship at a professional polymer manufacturing company called Heritage Plastics Incorporated. During my time there, I learned several techniques such as injection molding, blown film extrusion, and degradation testing. This internship, while invaluable to the expansion of my skillset, served as confirmation that my true desire is to pursue academia and continue in my

research-driven career. The hands-on research and industrial experience I have gained have shaped me into an adept researcher, well-prepared for graduate study, hopefully at the University of Massachusetts (UMass) Amherst. The polymer science and engineering program offered at UMass Amherst is particularly interesting to me as it includes a multi-disciplinary study of polymer physics, polymer mechanics, and biomimetic materials. I am especially attracted to the research of Dr. Reika Katsumata, who studies thin-film polymer composites. I have spoken with Dr. Katsumata about summer internship opportunities and I have been fortunate to join her weekly group meetings to learn more about the program in which I am most interested. To strengthen my candidacy for this program, I have undertaken a project which focuses on the electrical properties of flexible materials for biocompatible applications. Since being admitted to the School of Polymer Science and Engineering and joining a research laboratory, my goal to contribute to scientific research has become refined and focused but has remained consistent. It is with this goal in mind that I apply for the Barry M. Goldwater Scholarship, in hopes that the history of excellence for which the Goldwater Foundation is known will support my intended course of graduate study, and my ventures as a career research scientist.

* Describe an activity or experience that has been important in helping shape or reinforce your desire to pursue a research career in science, mathematics or engineering.	When I joined a research lab during my freshman year, I was still new to the sciences and was easily overwhelmed by the many unfamiliar instruments and techniques. I was unsure I would be able to catch on, let alone persist, in the fast-paced and ever-evolving world of scientific research. After only two weeks in the research lab, my mentor challenged me to learn the operation of small/wide-angle x-ray scattering (SAXS/WAXS) instrumentation in order to train a guest speaker who was visiting our department the very next week. I had previously never studied SAXS/WAXS but I was told that it was one of the most challenging techniques to learn, and few people were versed in it. With only one week to prepare, I embraced the challenge, spending hours reading the appropriate handbooks and guides, and even more time working alone with the instrument. When our guest arrived, not only was I able to demonstrate the technique, but our guest assumed I was a graduate student based on my proficiency. Following this event, I was honored to be named the sole undergraduate student in charge of the instrument. This rewarding experience reaffirmed my decision to pursue research, teaching me that there is always something to be learned in undertaking daunting challenges in research. Adequately preparing myself for what I knew would be a difficult situation has permeated all other facets of my research, and it serves as a valuable example of my own capabilities under stress and time constraints.
* In what way did COVID-19 or other hardships affect your research career plans and did those events alter your ability to pursue those plans? If COVID-19 did not influence your plans, simply state that there was no effect.	In the summer of 2020, I had planned to participate in a research experience for undergraduates (REU) at graduate schools with programs that interest me, such as UMass Amherst and Pennsylvania State University, but COVID-19 impacted this opportunity. Since most universities halted REU opportunities for the summer, I decided to pursue other options that might be useful to my research career. I previously made connections with engineers at Heritage Plastics Inc., which is a chemical engineering company in Picayune, MS. After speaking with their project director, I was able to secure a paid internship, which served as a means for me to gain industrial experience while solving problems by applying the techniques I had previously learned in my research lab. While I do not intend to pursue an industrial career after completing my undergraduate education, I was able to use this experience to supplement my knowledge over a summer that would have otherwise been squandered due to the COVID-19 pandemic.
(Optional question, answering the question below will depend on your personal experience.) Goldwater Scholars will be representative of the diverse economic, ethnic and occupational backgrounds of families in the United States. Describe any social and/or economic impacts you have encountered that influenced your education - either positively or negatively - and how you have dealt with them or incorporated them in your work to reach your career goals.	I am a first-generation college student, raised by my grandparents in a rural town in Mississippi. Both of my grandparents, along with my younger sister, suffered from congenital eye conditions that left them legally blind. As the only person in the household with unimpaired vision, I have been responsible for handling many aspects of our lives from a young age. Aiding my family in many of the most mundane of daily tasks falls to me. This responsibility delayed me from pursuing higher education after high school. In 2014, at the age of 20, I began studying theatre at USM but withdrew after only one semester due to family hardships. I regretted this decision and was fixed on returning to college, but my GPA was severely affected by the personal difficulties faced during my one semester. In 2018, I took advantage of USM's academic restart program, which allowed me to return to the university with a clean academic slate. Hoping to make the most of this rare opportunity, upon my return, I decided to pursue an especially challenging degree in Polymer Science and Engineering. As a child, I was never the most gifted in science and did not think I had the intellectual capabilities to pursue a career in STEM. However, after returning, I was able to build a strong foundation in mathematics and chemistry, and – most importantly – discover my love of research. The circuitous path that led me to where I am academically continues to inspire my journey to become a research scientist.

Research Projects and Skills

Question	Answer
Research Project #1	Pyrazine-flanked diketopyrrolopyrrole as a building block for thermoelectrics.
Starting Month	05
Starting Year	2019
Ongoing	No
Ending Month	09
Ending Year	2019
Average Hours/Week (Academic Year)	0
Average Hours/Week (Summer)	20
Name of Project Mentor	Xiaodan Gu
Position of Project Mentor	Assistant Professor of Polymer Science and Engineering
Affiliation of Project Mentor	The University of Southern Mississippi
Name of Project Mentor	Song Zhang
Position of Project Mentor	Graduate Researcher
Affiliation of Project Mentor	The University of Southern Mississippi
Name of Project Mentor	
Position of Project Mentor	
Affiliation of Project Mentor	
Institution where this research was performed	The University of Southern Mississippi
Description of research, including your involvement in AND contribution to the project. A separate narrative box has been provided for you to describe the research skills you acquired while working on this project.	In this collaborative project with Peking University in China, a new diketopyrrolopyrrole (DPP) derivative was synthesized with the deepest LUMO level of all reported DPP derivatives. The aim of this project was to combat the low electrical conductivities and low thermoelectric power factors that n-doped conjugated polymers usually exhibit. I was tasked with determining the degree of crystallinity and π-π stacking for DPP samples. Through x-ray diffraction analysis, I was able to document the energy loss of ionizing radiation during its travel through the DPP samples and construct a 2D image of the scattering signal. I then generated the appropriate Bragg curves and calculated the degree of crystallinity and π-π stacking, which we used in the publication of the research. Using the data that I generated, my fellow contributors were able to prove that their DPP polymer realizes closer π-π stacking, higher electron mobility, and higher electrical conductivity than previously seen.
Research Skills (Briefly describe any research skill(s) you developed while working on this project that will be important going forward in your research career.)	During this project, I refined my small/wide-angle x-ray scattering skills. This technique will be especially beneficial to my career in academia as it produces results that aid in the determination of the crystalline structures of polymers.
Do you have Papers/Publications associated with this research project?	Yes
If yes, how many publications are associated with this work?	1
Citation	Yan, Xinwen; Xiong, Miao; Li, Jia-Tong; Zhang, Song; Ahmad, Zachary; et al. 2019. Pyrazine-Flanked

Diketopyrrolopyrrole (DPP): A New Polymer Building Block for High-Performance n-Type Organic Thermoelectrics. Journal of the American Chemical Society. 1–8. ja-2019-101077

Question	Answer
Status	Published
How are you listed in the publication?	Author (but not the first author)
Type of Publication	National Professional Society Journal
Do you have Presentations associated with this research project?	No

---

Research Projects and Skills

Question	Answer
Research Project #2	Using controlled dip-coating to achieve high alignment of conjugated polymers.
Starting Month	12
Starting Year	2019
Ongoing	No
Ending Month	03
Ending Year	2020
Average Hours/Week (Academic Year)	20
Average Hours/Week (Summer)	
Name of Project Mentor	Xiaodan Gu
Position of Project Mentor	Assistant Professor of Polymer Science and Engineering
Affiliation of Project Mentor	The University of Southern Mississippi
Name of Project Mentor	Song Zhang
Position of Project Mentor	Graduate Researcher
Affiliation of Project Mentor	The University of Southern Mississippi
Name of Project Mentor	
Position of Project Mentor	
Affiliation of Project Mentor	
Institution where this research was performed	The University of Southern Mississippi
Description of research, including your involvement in AND contribution to the project. A separate narrative box has been provided for you to describe the research skills you acquired while working on this project.	The goal of this project was to achieve high polymer chain orientation and ordered thin-film microstructures to allow for efficient charge transport in conjugated polymers. By varying concentrations during a dip-coating process, we were able to increase the fraction of polymers that adopt planar backbones in accordance with the increase of aggregate size. This work promoted the ensuing assembly process of the polymers and aids the understanding of processing-related parameters in determining morphology of solution-cast thin films. For this project, I used grazing incidence wide-angle x-ray scattering (GIWAXS) to generate 2D images of polymer films, with the incident beam oriented parallelly and perpendicularly to the coating direction. The scattering data highlighted the out-of-plane π–π stacking peaks which shed light onto the morphology of the polymer systems in place. I was also able to generate dichroic ratios via GIWAXS for films deposited at different coating speeds.
Research Skills (Briefly describe any research skill(s) you developed while working on this project that will be important going forward in your research career.)	During this project, I was trained in atomic force microscopy (AFM) which provides compositional mapping with spatial resolution far below the usual optical diffraction limits. With this technique, I can monitor the surface alignment of materials as well as analyze morphological trends.
Do you have Papers/Publications associated with this research project?	Yes
If yes, how many publications are associated with this work?	1
Citation	Qi-Yi Li; Ze-Fan Yao; Yang Lu; Song Zhang; Zachary Ahmad; Jie-Yu Wang; Xiaodan Gu; Jian Pei. 2020. Achieving High Alignment of Conjugated Polymers by Controlled Dip-Coating. Advanced Electronic Materials. Vol. 6, ISSN 2199-160X
Status	Published
How are you listed in the publication?	Author (but not the first author)
Type of Publication	National Professional Society Journal
Do you have Presentations associated with this research project?	No

---

Research Projects and Skills

Question	Answer
Research Project #3	Developing spontaneously supersaturated nucleation for perovskite films.
Starting Month	02
Starting Year	2020
Ongoing	No
Ending Month	06
Ending Year	2020
Average Hours/Week (Academic Year)	20
Average Hours/Week (Summer)	
Name of Project Mentor	Xiaodan Gu
Position of Project Mentor	Assistant Professor of Polymer Science and Engineering
Affiliation of Project Mentor	The University of Southern Mississippi
Name of Project Mentor	Song Zhang
Position of Project Mentor	Graduate Researcher
Affiliation of Project Mentor	The University of Southern Mississippi
Name of Project Mentor	Bo Li
Position of Project Mentor	Graduate Researcher
Affiliation of Project Mentor	Jackson State University
Institution where this research was performed	The University of Southern Mississippi
Description of research, including your involvement in AND contribution to the project. A separate narrative box has been provided for you to describe the research skills you acquired while working on this project.	Through this collaboration with scientists at Jackson State University, we were able to address the small device size and narrow operation windows which limit the applications for perovskite films predominantly prepared by anti-solvent assisted spin-coating in practical and scalable production. It was my responsibility to study the preferred crystal growth orientation for perovskite films. I performed x-ray scattering analysis on thin film samples and analyzed the inhomogeneous intensity distribution of the scattering rings which could be observed in certain samples. My analysis aided in confirming the reproducibility of highly crystalline perovskite films which were synthesized at Jackson State University. The results of this project suggest that the spontaneously supersaturated nucleation approach holds great potential to the application of scalable solution processing techniques.
Research Skills (Briefly describe any research skill(s) you developed	Over the duration of this experiment, I learned gel permeation chromatography (GPC), which details both the

Question	Answer
while working on this project that will be important going forward in your research career.)	number average and weight average molecular weights of various polymers. With this technique, I can analyze the polydispersity of materials as a means of understanding polymer morphology.
Do you have Papers/Publications associated with this research project?	Yes
If yes, how many publications are associated with this work?	1
Citation	Bo Li, Qiqi Zhang, Song Zhang, Zachary Ahmad, et al. 2021. Spontaneously Supersaturated Nucleation Strategy for High Reproducible and Efficient Perovskite Solar Cells. Chemical Engineering Journal, Volume 405, 126998, ISSN 1385-8947.
Status	Published
How are you listed in the publication?	Author (but not the first author)
Type of Publication	National Professional Society Journal
Do you have Presentations associated with this research project?	No

Research Projects and Skills

Question	Answer
Research Project #4	Flexible partially conjugated polymers as the ductile matrix in blend systems.
Starting Month	06
Starting Year	2020
Ongoing	Yes
Average Hours/Week (Academic Year)	20
Average Hours/Week (Summer)	20
Name of Project Mentor	Xiaodan Gu
Position of Project Mentor	Assistant Professor of Polymer Science and Engineering
Affiliation of Project Mentor	The University of Southern Mississippi
Name of Project Mentor	Luke Galuska
Position of Project Mentor	Graduate Researcher
Affiliation of Project Mentor	The University of Southern Mississippi
Name of Project Mentor	
Position of Project Mentor	
Affiliation of Project Mentor	
Institution where this research was performed	The University of Southern Mississippi
Description of research, including your involvement in AND contribution to the project. A separate narrative box has been provided for you to describe the research skills you acquired while working on this project.	For this project, I have blended a conjugated polymer (PNDI-C4), which exhibits high ductility, with a fully conjugated polymer (PNDI-C0) in the hopes of combining both high ductility and electrical performance. Upon blending, we observed the phase separation of the polymers to form a given morphology. Through the duration of this project, we employed wide-angle x-ray scattering (WAXS) analysis to monitor the crystalline alignment, polarized ultraviolet (UV)-Visible spectroscopy to monitor the full chain backbone alignment, and atomic force microscopy to monitor surface alignment. My graduate mentor and I also employed x-ray photoelectron spectroscopy (XPS) to determine if these polymers vertically phase segregate versus segregate throughout the thickness of the film. The results of this project have clarified the utility of flexible partially conjugated polymers as the matrix in blend systems as well as lead to an understanding of blend morphology for similar components.
Research Skills (Briefly describe any research skill(s) you developed while working on this project that will be important going forward in your research career.)	Ultraviolet (UV)-Vis spectroscopy is a technique that will aid my future research as it allows for measurement of the absorption of radiation due to light's interaction with a given material. I plan to employ this skill as I investigate the optoelectronic properties of the thin films I generate.
Do you have Papers/Publications associated with this research project?	Yes
If yes, how many publications are associated with this work?	1
Citation	Luke Galuska; Eric S. Muckley; Zhiqiang Cao; Dakota F. Ehlenberg; Zachary Ahmad; et al. 2020. Role of Water on Correlated Structural and Mechanical Response of Water-Supported and Free-Standing Ultrathin Films. Nature Communications. Submitted 12/2020
Status	Submitted
How are you listed in the publication?	Author (but not the first author)
Type of Publication	National Professional Society Journal
Do you have Presentations associated with this research project?	No

Research Projects and Skills

Question	Answer
Research Project #5	Origin of strain-induced chain alignment in PDPP-based semiconducting polymers.
Starting Month	07
Starting Year	2020
Ongoing	Yes
Average Hours/Week (Academic Year)	20
Average Hours/Week (Summer)	20
Name of Project Mentor	Xiaodan Gu
Position of Project Mentor	Assistant Professor of Polymer Science and Engineering
Affiliation of Project Mentor	The University of Southern Mississippi
Name of Project Mentor	Song Zhang
Position of Project Mentor	Graduate Researcher
Affiliation of Project Mentor	The University of Southern Mississippi
Name of Project Mentor	
Position of Project Mentor	
Affiliation of Project Mentor	
Institution where this research was performed	The University of Southern Mississippi
Description of research, including your involvement in AND contribution to the project. A separate narrative box has been provided for you to describe the research skills you acquired while working on this project.	In this project, we investigated donor-acceptor (D-A) type semiconducting polymers in order to gain a better understanding of their morphological changes upon mechanical deformation. The Gu research group probed the molecular orientation of diketopyrrolopyrrole (DPP)-based D-A polymer thin films under tensile deformation. We learned that the detailed morphological analysis demonstrated highly aligned polymer crystallites through in-plane rotation, while the degree of backbone alignment was limited within crystalline domains. In this study, I aided in deconvoluting the alignment of different components within the thin-film microstructure by performing peak fitting analysis of X-ray crystallography data. My calculations for the degree of crystallinity for the materials supported my mentor's hypothesis that crystallite rotation and amorphous chain slippage are the primary chain alignment mechanisms for semiconducting polymers.
Research Skills (Briefly describe any research skill(s) you developed	Working on this project allowed me to study and apply Raman Spectroscopy, a form of chemical analysis that

while working on this project that will be important going forward in your research career.) | is based on light scattering. This technique will aid in my future research as it will allow me to examine the spatial distribution of the components within a sample at nanometer resolution.

Question	Answer
Do you have Papers/Publications associated with this research project?	Yes
If yes, how many publications are associated with this work?	1
Citation	Song Zhang, Amirhadi Alesadi, Mariia Selivanova, Kai-Lin Chen, Guillaume Freychet, Luke Galuska, Yu-Hsuan Cheng, Michael U. Ocheje, Guorong Ma, Zachary Ahmad, et al. 2020. Molecular Origin of Strain-Induced Chain Alignment in PDPP-Based Semiconducting Polymers. Advanced Materials. Submitted 11/2020
Status	Submitted
How are you listed in the publication?	Author (but not the first author)
Type of Publication	National Professional Society Journal
Do you have Presentations associated with this research project?	No

---

Mentor Recognition Information

Question	Answer
Mentor Name	Xiaodan Gu
Title	Dr.
Mentor Name	Luke Galuska
Title	Mr.
Mentor Name	Song Zhang
Title	Mr.

Other Activities and Accomplishments

Question	Answer
Activity/Accomplishment	Student Organization
Organization (if applicable)	The Polymer Science Association
Scope of Activity/Accomplishment	College/University
Role/Involvement	I have sparked interest in our club through outreach activities and the introduction of several new programs which aid student retention. Additionally, I recently initiated a Diversity Committee for our organization to promote minority involvement.
Leadership Position	President
Length of Involvement	More than one academic year

Other Activities and Accomplishments

Question	Answer
Activity/Accomplishment	Professional Organization
Organization (if applicable)	SAMPE
Scope of Activity/Accomplishment	International
Role/Involvement	My membership in SAMPE combined with my leadership of PSA has allowed me to create a SAMPE committee in PSA that coordinates with the university chapter to provide opportunities to our students and to better organize outreach events.
Leadership Position	Member
Length of Involvement	Academic Year

Other Activities and Accomplishments

Question	Answer
Activity/Accomplishment	Student Organization
Organization (if applicable)	Honors College Leadership Council
Scope of Activity/Accomplishment	College/University
Role/Involvement	As a selected member of the Academic Committee of the Council, I have been able to meet virtually and face-to-face to tutor students in subjects such as physics, calculus, and organic chemistry.
Leadership Position	Committee Member
Length of Involvement	Academic Year

Other Activities and Accomplishments

Question	Answer
Activity/Accomplishment	Professional Organization
Organization (if applicable)	Soc. of Industrial and Applied Math
Scope of Activity/Accomplishment	International
Role/Involvement	I have been able to tutor my peers, promote the organization, and help provide a means for graduate and undergraduate students in my own degree path to present their research at symposia and conferences.
Leadership Position	Member
Length of Involvement	Academic Year

Other Activities and Accomplishments

Question	Answer
Activity/Accomplishment	Community Involvement
Organization (if applicable)	Mississippi Council for the Blind
Scope of Activity/Accomplishment	Community
Role/Involvement	My contributions include ordering and allocating funds for adaptive technology to provide services for blind and visually impaired individuals and providing equipment for elementary to college-aged blind students.
Leadership Position	Member

Length of Involvement   More than one academic year

Recognitions

Question	Answer
Recognition	Ronald E. McNair Scholars Program
Type	National
Award Description	In this federally funded program, I will participate in graduate level courses and attend conferences and symposia where I will present my own research. My progress will be aided by faculty mentors whose aim is to prepare me for Ph.D. completion.
Award Year	2020

Recognitions

Question	Answer
Recognition	Coatings Industry Education Foundation (CIEF)
Type	College/University
Award Description	I was awarded the Frank Borrelle Leadership Award, which is the largest monetary award and highest distinction offered by CIEF. I was selected for this award due to my dedication to serving as a mentor to the younger students in our program.
Award Year	2020

Recognitions

Question	Answer
Recognition	The Kristen Bower Scholarship
Type	College/University
Award Description	The Kristen Bower scholarship is awarded to a dedicated student who earns scholarship assistance through hard work and sacrifice. I was selected based on a combination of my grades and my commitment to earning a degree as a nontraditional student.
Award Year	2020

Recognitions

Question	Answer
Recognition	The Honors College Keystone Scholarship
Type	College/University
Award Description	The Honors College Keystone Program offers an enriched and challenging educational experience for highly engaged students. I will design an original project which will serve as my senior Honors Thesis and I will graduate with Latin distinction.
Award Year	2020

Current College/University

Question	Answer
* Institution type:	4-year institution
* Are you a transfer student (i.e., Did you transfer from another academic institution to the institution that is nominating you for a Goldwater scholarship?)	No
* Field of study	Materials Research
Materials Research areas of specialization	Polymers
* Period through the end of which you will be reporting your GPA	Spring 2020
* Official cumulative unweighted GPA through the period reported above	3.71
* How many credit hours does your school require for graduation?	124
* How many credit hours will you achieve as of January 1, 2021?	90
* How many credit hours do you plan to achieve for graduation?	136
* Expected baccalaureate graduation month	05
* Expected baccalaureate graduation year	2022
* According to the definition provided above, indicate whether you are a sophomore or junior.	Junior
* Matriculation status at the institution you will be attending during the 2021-2022 academic year	Currently Enrolled
* Have you been involved in or do you plan to Study Abroad?	No

---

Coursework

Question	Answer
Current Course 1	Organic Polymer Chemistry 1
Course Level	Undergraduate
Current Course 2	Problem Solving and Numerical Analysis
Course Level	Undergraduate
Current Course 3	Polymer Techniques 1
Course Level	Undergraduate
Current Course 4	Polymer Rheology
Course Level	Undergraduate
Current Course 5	Calculus 3 with Analytical Geometry
Course Level	Undergraduate
Current Course 6	Honors Thesis
Course Level	Undergraduate
Future Course 1	Polymer Organic Chemistry 2
Course Level	Undergraduate

Future Course 2	Polymer Processing
Course Level	Undergraduate
Future Course 3	Thermodynamics
Course Level	Undergraduate
Future Course 4	Analysis of Composite Materials
Course Level	Undergraduate
Future Course 5	Polymer Mechanics
Course Level	Undergraduate
Future Course 6	Nuclear Magnetic Resonance
Course Level	Graduate
Course outside of Major 1	Graduate Research Design
Course Level	Graduate
Course outside of Major 2	Calculus 4 with Analytic Geometry
Course Level	Undergraduate
Course outside of Major 3	Linear Algebra
Course Level	Undergraduate
Course outside of Major 4	Discreet Math
Course Level	Undergraduate
Course outside of Major 5	Structural Elucidation
Course Level	Undergraduate
Course outside of Major 6	
Course Level	

Previous Schools attended

Question	Answer
School Name	University of Southern Mississippi
City	Hattiesburg
State	MS
Institution type:	4-year institution
Dates attended	May 2017 to current
Unweighted GPA on a 4.00 scale	3.71
Will you be providing a transcript from this school to your Goldwater Campus Representative?	Yes

Future Academic plans

Question	Answer
* Is the institution you will be attending for the 2021-2022 academic year the same as your current academic institution?	Yes

Certification and Release

████████████████████████

Supporting Documentation

File Type / Description	Description
Essay	Zachary Ahmad Research Essay