



MESSAGE FROM INTERIM PRESIDENT MARTIN SCHIMPF

It is with real pleasure that I write to introduce this 14th volume of the McNair Scholars Research Journal. The papers contained in this volume represent a remarkable breadth of scholarship that encompasses some of the best of what Boise State University has to offer. The Scholars, their faculty mentors, the staff of the McNair Program, and all of us at Boise State are very proud of this work.

Congratulations to all of the 2019 McNair Scholars for your achievements over the past year. In particular, I want to acknowledge the hard work and accomplishments of the senior Scholars whose research is represented in the papers in this publication. McNair scholars work with faculty mentors who are committed to the rigors of scholarship—a working relationship that both students and faculty describe as unique and beneficial. I also want to recognize and thank all of the faculty mentors who have worked with our McNair Scholars. It is your patience, guidance, and encouragement that promotes the transformation of these students into scholars.

The Ronald E. McNair Post-Baccalaureate Achievement Program honors the memory and achievement of the late Dr. Ronald E. McNair, a physicist and NASA astronaut. Its goal is to encourage undergraduates from underrepresented backgrounds to emulate the academic and professional accomplishments of Dr. McNair by facilitating their pursuit of doctoral degrees and academic careers in teaching and research. The McNair Scholars Research Journal is evidence that the McNair Program provides a valuable opportunity for these students to explore research on significant issues. The McNair Program also provides students access to nationwide conferences and graduate schools where they can present their original projects and meet doctoral faculty. Completing its fourteenth year on our campus, the program's formula for helping students gain access to graduate school programs has proven very successful for a vast majority of those who have participated since its inception.

The research presented here signals the arrival of a new group of rising scholars who will carry their talents, enthusiasm, and hard work ahead into graduate programs here and across the country. I hope that you will continue to aspire, achieve, and pursue your dreams.

Again, congratulations and best wishes.

Sincerely,

Martin E. Schimpf

Martin Schimpf

MESSAGE FROM THE DIRECTOR

We are very happy to be publishing our 14th volume of the Boise State *McNair Scholars Research Journal* and is the culmination of the research component of the McNair Scholars Program. The papers presented here are the outcome of the McNair Scholars' research projects conducted during their participation in the program and demonstrate the variety of excellent undergraduate research that can be produced when students are provided meaningful support through collaborative efforts.

Maintaining a high standard of excellence throughout this process, these McNair Scholars have become skillful researchers and have clearly demonstrated their eagerness to engage in the demands of this work. They have developed important analytical and methodological skills, academic sophistication, and confidence that will aid in their success in their graduate school programs. This journal provides them an opportunity to have their research published and to gain an early understanding of the importance of disseminating their work for others to utilize. It also helps substantiate the role publishing will play in their future careers. It is appropriate that their efforts culminate in the recognition of their work through this journal.

We would like to send a sincere thank you to each graduate for desiring to become participants in our Boise State McNair Scholars Program. Through your hard work you have developed into scholars. Remember that, through this process, you share a tremendous bond with all McNair Scholars who have come before you and we look forward to seeing your future engagement with those who will follow in your footsteps. We also look forward to hearing about your future scholarly accomplishments.

Finally, we would like to extend our deepest gratitude to the faculty mentors who guided and supported the McNair Scholars highlighted this year, as well as those who have mentored scholars throughout the life of our program. The work published in this journal would not be possible without your dedication to the research endeavors of our scholars. You have been instrumental in providing a solid research foundation that has given each of our scholars the ability to enter graduate school with confidence. In so doing, you have also appreciably aided in our program success giving us a tremendous ability to continue with this work. Thank you.

Congratulations McNair Scholars!



Gregory Martinez
Director



Sarah Ritter
Program Coordinator