The 2019 JSA/HUGS International Fellowships were awarded to
- Mrs. Hassnae El Jarrari, from Mohammed V University in Rabat, Morocco, doing her PhD on experimental high energy physics under the supervision of Prof. Tayalati Yahya.
- Mr. Johann Edir Hernández Ybarra, from Universidad Autónoma de San Luis Potosí in Mexico, doing his PhD on theoretical hadron physics under the supervision of Prof. Rubén Flores Mendieta.

Selection process

The fellowship was officially announced on November 30, 2018 and applications received before the deadline of January 20, 2019, were given full consideration. As the previous year, the fellowship had an independent webpage (Link) with its own application process separate from the HUGS regular application process and a Facebook group. In this way we again used social media to promote the fellowship. The applicants had to provide a motivation letter and at least two recommendation letters to be submitted directly to the fellowship managers by the endorsers. Recommendation letters directly provided by the applicants were not accepted. We received 10 complete applications: 3 from India, 2 from Morocco, 1 from Palestine, 1 from Argentina, 1 from Ethiopia, 1 from Democratic Republic of Congo, and 1 from Burma.

The selection committee members (Alberto Accardi, Cesar Fernandez-Ramirez, Rolf Ent, Jose Goity, Cynthia Keppel and Michael Khol) made independent evaluations on the candidates worth following the guidelines detailed in the Fellowship application and reported their own conclusions to the rest of the committee members in through e-mail. The final selection was made by consensus. Out of the ten applicants, two outstanding students were considered worth of the fellowship: Hassnae El Jarrari (Morocco) and Raj Kishori (India), but we did not have enough funding to cover for all the two students. Fortunately, due to the high level of the candidates, Rolf Ent, on behalf of the Physics Division, offered additional funding for one plane ticket.

The Department of State is currently taking extra time in the review process of visa applications. As a consequence, Raj Kishori could not obtain the visa on time to attend the school (Hassnae El Jarrari obtained the visa just the week before the beginning of the school). This problem happened to other students attending the HUGS school. Hence, we got money left that we believed was better used supporting a worthy student. Out of all the HUGS students we identified those who had to do a special financial effort to attend the school and finally selected Johann Edir Hernández Ybarra, from Universidad Autónoma de San Luis Potosí in Mexico. His university is a state owned university with scarce resources and, as other institutions, is facing financial stress due to new
scientific policies in Mexico. Hence we decided to cover his flight change expenses as well as two additional weeks at Jefferson Lab after the HUGS school. Consequently, the JSA funds plus the generosity of JLab’s Physics Division and matching funds from the DOE grant sponsoring the HUGS school, allowed two talented PhD students from developing countries to attend 2019 HUGS and to stay two additional weeks at Jefferson Lab to start a collaboration with JLab researchers. Both students stayed from May, 27 to June 29, 2018, visiting the Theory Center and the Physics Division.

Budget, leveraged support and matching resources

Given the reduced budget granted to this program compared to the request, we still have been able to support 2 students, granting them three additional weeks to visit Jefferson Lab. In detail, the awarded $4500.00 have been allocated as follows:

- $1,273.00 spent on Mrs. El Jarrari’s flight and $99 on additional transportation; $349.60 spent on Mr. Hernandez’s flight and $99 on additional transportation; $1,033.50 spent on Mrs. El Jarrari’s lodging; $137.80 spent on Mr. Hernández’s lodging at the Residence Facility; $940.02 spent on Mr. Hernández’s lodging at a nearby hotel; $202.97 spent on Mrs El Jarrari’s meals in addition to HUGS provided funding; $320.43 spent on Mr. Hernández’s meals in addition to HUGS provided funding.

These add up to $4,455.32 from the JSA Initiatives Fund. Matching funds were provided by

- Hampton University contributed a total of $3,956.00 to cover lodging during HUGS and meals;
- The Physics Division contributed a total of $818.07 to cover part of Mr. Hernández’s flights.

The total cost of the program has been

$$4,455.32 \text{ (JSA)} + 3,956.00 \text{ (HU)} + 818.07 \text{ (PHY)} = 9,229.39$$

Fellows activities

The fellows spent 5 weeks at Jefferson Lab. Three of these were devoted to attending the HUGS lectures and participated in all activities within the school, including scheduled social meetings with the lecturers and delivering short presentations in front of their fellow attendees to HUGS. As supplemental material, we enclose the exit reports by Mrs. El Jarrari and Mr. Hernández.

Both fellows arrived the week the HUGS program started. In the last 2 weeks, after the end of teh school, they interacted with Jefferson Lab’s researchers. Both students were provided with office space in the Theory Center.

- **Mrs. Hassnae El Jarrari**, She had meetings with Prof. Jose Goity and Prof. Michael Kohl, as well as the members of Hall A, Hall B and Hall C collaborations attending the CLAS12, JLab Users and Hall A and C summer meetings.
- **Mr. Johann Edir Hernández Ybarra** He had meetings with José Goity and Prof. Emilie Passemar, and started working with Prof. Passemar on pion-nucleon interaction using dispersive methods.
Final considerations

The quality of the candidates was outstanding and awarding the fellowships proved to be a difficult task. We also had the mentioned problem with the visa applications, commonplace to many HUGS students. Nevertheless we believe we selected the best candidates and that we gave Mrs. El Jarrari and Mr. Hernández an opportunity for learning and career enhancement that otherwise would have not been available to them. We are very pleased that they really took advantage of the possibility to attend the HUGS school, intensely discuss with JLab researchers, and lay the groundwork for future collaborations. In our estimation this initiative has been very successful and has met all the objectives of the proposal.

We would like to highlight the high quality level of the candidates. Our initial goal in the proposal was to fund two students for their trips and two additional weeks. This was achieved thanks to the generosity of the Physics Division providing additional funds and to the early advertisement of the fellowship, which, given the visa issues was instrumental to at least allow Mrs. El Jarrari to attend the school. However, increasing costs would prevent us to provide the same conditions to future fellows if there is no increase in funding.

This shows how fellowships of this kind are in great demand and how important its impact can be. We also would like to thank the Physics Division for providing additional funds ($818,07).
To whom it may concern,

I am a Masters student at the Autonomous University of San Luis Potosi, Mexico. My work consists mainly on the study of the renormalization of the baryon axial vector current in the formalism of Heavy baryon chiral perturbation theory in the large Nc limit, where Nc is the number of colors, that works as an effective theory for nonperturbative QCD.

This year I was granted the JSA/HUGS International Fellowship for Graduate Students in Developing Countries, which fully covered my expenses to attend the 31th Annual Hampton University Graduate Studies Program (HUGS), and to stay two additional weeks at the Thomas Jefferson National Accelerator Facility (Jefferson Lab).

All of the lectures in HUGS were amazing, they treated very different points of view but still closely related to my work, that is nonperturbative QCD. I learned a lot about the QCD factorization and some techniques in PDF, GPD, FF and other approaches in the parton model, the knowledge that I acquire was too general but it was reinforcement by the recitation sessions. Moreover, the experimental lectures gave information on how work some important projects around the world and how theire results are obtained, thus providing an outline on how to appropriately make use of the theory. But, the must important part was the relation with the lecturers and the friendly discussions about many different topics with the other students at the SURA Residence Facility during the three weeks of the School. About the schedule, it was perfect for me, because I can attend to all of the activities of the HUGS and then work in other things in the afternoon.

At my extended stay I had the opportunity to have a lot of interesting discussions with José Goity about effective field theories in QCD and we worked on the renormalization of the scalar coupling in chiral perturbation theory with the large Nc limit, also in my last week I had the opportunity to work in a very different topic with José Goity and Emilie Passemar, who was visiting Jlab and give us an interesting point of view to compare our results using dispersion theory to make a different analysis for the pion-nucleon interactions. The perspective of the work is continue with the research and finish all the calculations to possibly write a paper in collaboration with José and Emilie. I look forward to strengthen research collaborations and hope to get other chances to visit the Jefferson Lab in the future. I really enjoy the additional stay at Jefferson Lab and I already started working on a new collaboration, so I think that is impossible to obtain more benefits from it.

I am grateful to have been given this opportunity. I believe this experience will have a deep impact in the general develop in science for me and for the other HUGS students. Finally, the support that JSA/HUGS Fellowship gave me was the best thing of my summer, because all of the lecturer, discussions, talks, friends and new research works that got from HUGS and Jlab had been impossible without it. I really hope that this program keep helping more students to enrolled in particle physics as it did with me.

Sincerely,
Johann Edir Hernández Ybarra
In this report, I would first like to express my strong gratitude to the JSA/HUGS fellowship organizers. I am currently a PhD student in experimental high energy physics at Mohammed V University in Rabat, Morocco. My PhD thesis project is centered on the searches for Dark Matter signals with the ATLAS detector via the search for massless dark photons coupling to Higgs boson.

This year, I have been granted the JSA/HUGS International Fellowship for Graduate Students in Developing Countries, which has fully covered all expenses to attend the 34th Annual Hampton University Graduate Studies Program (HUGS) and to stay for two additional weeks at the Thomas Jefferson National Accelerator Facility.

The lectures given in HUGS have been an enlightening experience to learn more about the theoretical and experimental aspects of the present Jefferson Lab physics program as well as the future Electron-Ion Collider. Being an experimentalist in high energy physics, I was eager to discover activities in other laboratories, especially Jefferson Lab, as many physics topics present a lot of similarities with my current interests, thought with a different experimental approach. Furthermore, the theoretical lectures where very useful to understand the physics basics behind many experimental results in our field. Additionally, during the students seminar session of HUGS, I had the opportunity to present my work and to interact with students and researchers as Pr. Jose Goity, who helped me a lot to understand more about the theoretical aspect of my PhD project.

Moreover, the additional two weeks at JLab offered me a unique opportunity to attend different meetings such as: the CLAS 12 experiment in Hall B, JLab Users and Hall A and C summer meetings. Interacting with people from different experiments was very beneficial as I had interesting discussions with JLab scientists involved in Heavy Photon Searches experiment. Also, I was introduced to both theorists and experimentalists who, not only gave an overview of their work, but also provided very helpful information related to my work. Meeting Dr. Michael Kohl, Professor at Hampton University, and Staff Research Scientist at JLab was very motivating for me to develop more interest in the JLab physics program. Contact with other members and students was also greatly appreciated.
Finally, I strongly believe this experience will have a deep impact on my professional future. Given the limited funding in Morocco, this experience would not have been possible without the full financial support from the JSA/HUGS Fellowship. Therefore, I am very grateful to have been given this very enriching opportunity. I certainly look forward to strengthening my research collaboration as well as networking. I hope to get other chances to visit the Jefferson Lab in the future.

Sincerely,

Hassnae El Jarrari