LONDON INTERNATIONAL YOUTH SCIENCE FORUM

IMPACT REPORT

2020/21 REPORT

LIYSF CIC

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LIYSF IMPACT REPORT

This is the first impact report for the London International Youth Science Forum (LIYSF CIC), coinciding with our transition into a not-for-profit social enterprise. I cannot express how exciting it is to be building on our prestigious 60-plus year history to ensure LIYSF has a bright, sustainable and successful future.

LIYSF is an incredible event that has changed the lives of over 22,000 students and counting. It has a rich history of empowering young science students from across the globe, by facilitating opportunities and networks to enable them. LIYSF has worked hard to help those from disadvantaged backgrounds and to empower female scientists as well as Black, Asian and minority ethnic students. The strategy for the future is to build on this ethical foundation and help more students reach further. Just one example is our scholarship scheme, which we are growing.

Moving forwards as a community interest company (CIC), limited by guarantee, LIYSF CIC will provide greater transparency, as well as afford new opportunities and possibilities, with organisations having a clear understanding of our objectives and status. This report, along with new efforts as LIYSF CIC, will look to; consolidate impact initiatives; provide more strategy and structure; and help communicate our successes. Measuring and reporting social impact is inherently challenging. More challenging still with an activity like LIYSF, which has a varied and far reaching impact over a long period of time. We will be looking for expert help to assist with assessing our impact.

I am proud of the work we do and extremely excited about our future. We are fortunate to have the support and trust of leading scientific figures and organisations across the globe, as well as wonderfully enthusiastic and dedicated students. They all inspire us to be better and I would welcome further thoughts, from any of our stakeholders and friends, on what we can do to achieve greater impact, or how we can better report upon it.

LIYSF is already a precedent unto itself and we strive to detect the ripples of our impact through the generations of students that shape us and into the future we aim to define. This is an exciting time to be brave, to be honest, to be better.

Richard Myhill
Chief Executive

WHAT WE DO

The primary function of LIYSF CIC is to organise the annual London International Youth Science Forum (LIYSF). LIYSF was started in 1959 with the idea of bringing young people from different nations together to learn about each other and our different cultures through a shared passion for science. LIYSF was formed in the aftermath of the world wars, placing equal focus on cultural understanding as well as science learning and discovery. We cover all STEM when we say science.

- Annual residential science enrichment programme
- 15-day programme with the latest science research, including, health, artificial intelligence, cyber security, sustainable food, energy, climate change, pandemics, nano- technology, engineering and robotics
- Next generation of the best young science students attend annual forum
- 500 students selected each year based on talent
- Students aged 16-21 years old attend from more than 70 countries
- 12 plenary lectures from Nobel prize Laureates, academic and industry pioneers
- 32 specialist lectures from leading researchers
- 50 visits to top university departments, research centres and industrial sites across the UK - including Oxford and Cambridge Universities and industrial sites, like Rolls Royce, Airbus and government facilities
- Deliver platform of young talent to bring ideas to tackle global challenges
- Most participants are supported to attend as prize winners of national and international science competitions. Many receive scholarships from educational bodies, schools and colleges, grants from institutions and funding from charitable foundations
- There is an active social calendar at LIYSF to facilitate interaction and sharing cultures, with 10 events in the programme. A vital part of LIYSF is about students teaching and learning about different cultures and traditions

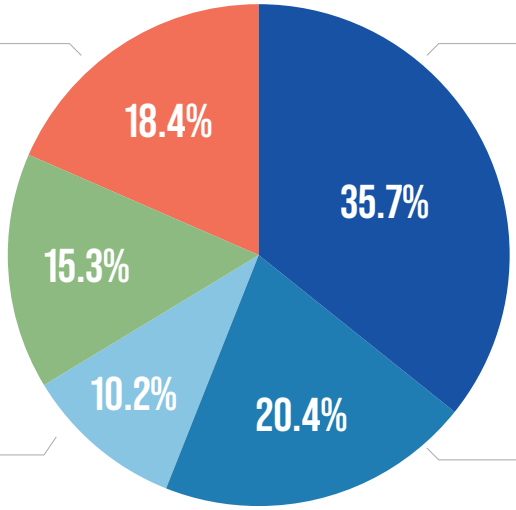
"LIYSF aims to give a deeper insight into science and its applications for the benefit of all humankind and to develop a greater understanding between young people of all nations."

CONNECTING
STUDENTS GLOBALLY

70 COUNTRIES

65% OF ATTENDEES ARE FROM OUTSIDE THE EU

ATTENDANCE
MAKE-UP



18.4%
SELECTED BY THIRD PARTY APPOINTED ORGANISATION

35.7%
INDEPENDENT STUDENT APPLICATIONS

15.3%
THROUGH SCHOOL / UNIVERSITY

10.2%
INTERNATIONAL COMPETITIONS

20.4%
SELECTED BY GOVERNMENTAL NATIONAL BODY

LIYSF TIMELINE

1959

LIYSF established under World Friends initiative with Royal Patronage. **HRH Duke of Edinburgh** is Patron until 1969 and attends first forums

1963

Nobel Prize winner **Sir John Cockcroft** appointed Honorary President

1964

George McGowan appointed Director, serves until 2003. **John Needle**, Deputy Director & Director 2003-2008

1968

Nobel Prize winner Professor **Sir Lawrence Bragg** appointed Honorary President

1972

Nobel Prize winner Professor **Sir Joseph Rotblat** appointed Honorary President

1980

LIYSF separated from World Friends as independent initiative and continues as Council for International Contact

1983

HRH Duke of Kent becomes Royal Patron, until 1988

1987

Nobel Prize winner, the **Rt Hon Lord Porter** appointed Honorary President

2005

Professor Richard O'Kennedy appointed Honorary President, until 2017 and then appointed **LIYSF Science Patron**

2008

ECE Travel acquires LIYSF and appoints **Richard Myhill** as Director

2016

LIYSF is granted **UNESCO** patronage, received annually to date

2018

Professor Clare Elwell appointed Honorary President

2019

HRH The Princess Royal opens 61st LIYSF

2020

Richard Myhill transitions LIYSF into a not-for-profit social enterprise **(CIC)**

OUR VISION

LIYSF provides benefit to students aged 16 - 21 years old that are interested in science, technology, engineering and mathematics. LIYSF enables students in the pursuit of science for the benefit of all. Empowering passionate individuals and to facilitate capacity building. This is our community purpose interest as a community interest company, limited by guarantee (CIC).

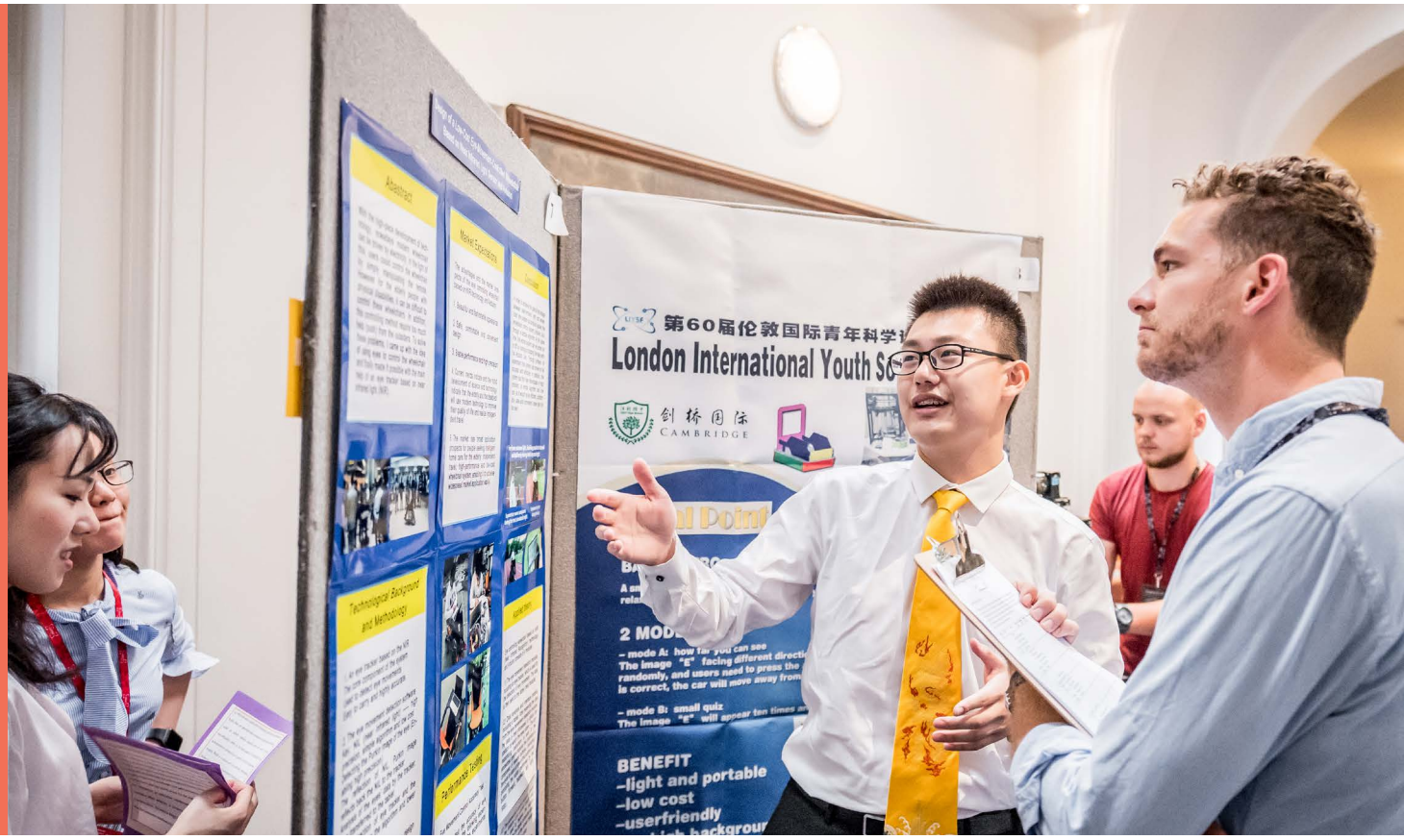
KEY GOALS

- Education, with a focus on the application of knowledge for economic & social benefit
- Positive impact on individuals and through them on the world
- Empowerment in STEM. Enabling students to explore and fulfil individual potential
- Enabling students to acquire skills, confidence and knowledge
- Facilitate and showcase international collaboration
- Challenge students to think in new ways
- Encourage and enable networking
- Training in effective communication
- Cultural interaction to ensure open and informed world citizens

LIYSF contributes to all 17 UN sustainable development goals, with proactive action and effect on the thinkers of the future.

UNIQUE ACHIEVEMENTS

- Connecting 22,000 students over 60 years
- Deliver respected academic STEM programme, proven track record
- Longest running student science forum of its kind, not a competition
- Established under Royal Patronage in 1959, HRH The Princess Royal attending in 2019
- Independent academic president, currently Professor Clare Elwell, University College London
- UNESCO Patronage, Government support, British Council partnership
- World renowned venues in central London with global reach – Imperial College London & Royal Geographical Society
- Raft of success stories of former LIYSF alumni going on to change the world
- Diversity – strong focus on cultural interaction
- Over 50% of attending students are female
- Diversity of speakers, including gender balance with 50% female speakers
- 65% of attendees from outside EU
- Nature of event nurtures students to stay connected long after event



"LIYSF is an amazing forum with tremendous energy, truly inspiring and exciting."

Sir Jeremy Farrar, Director Wellcome Trust
2018 Key Note LIYSF Speaker

LIYSF ALUMNI GO ON TO CHANGE THE WORLD

Professor Clare Elwell

Vice Dean
University College London

Mark Shuttleworth

CEO
Cannonical Ltd.
First African Civilian Astronaut

Dr Michael Amoo

Specialist Registrar
In Neurosurgery
Royal College
of Surgeons

Professor Richard O'Kennedy

Vice President
of Research, Qatar
Foundation

Dr Rubika Balendra

Clinical Neurology
King's College London

Dr Michael Moloney

CEO
American Institute
of Physics

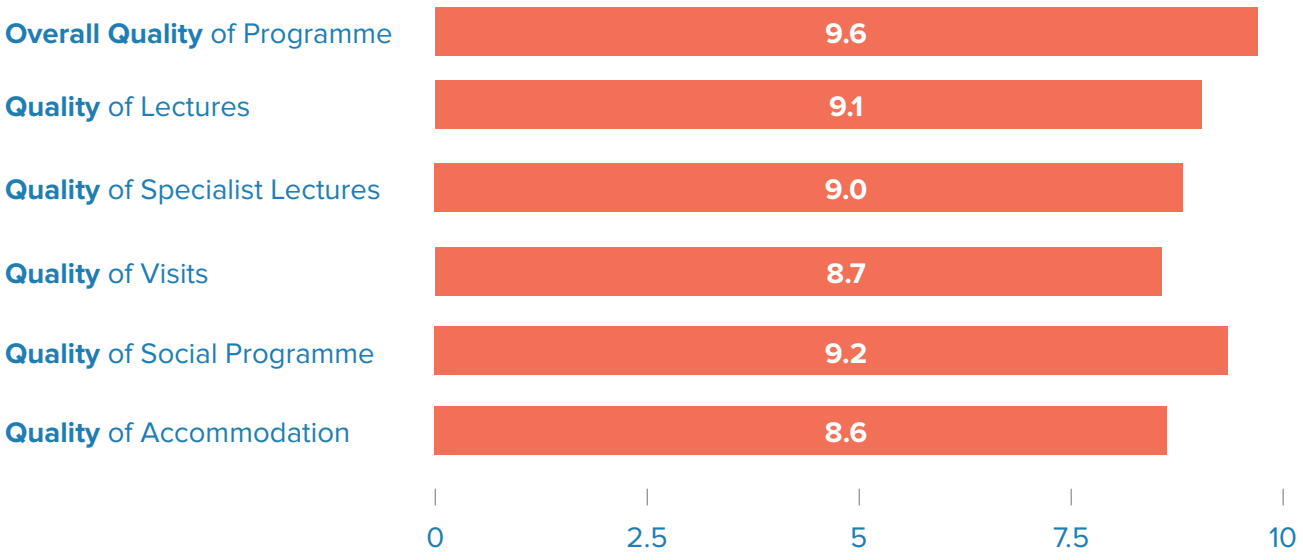
Professor Christopher Kennard

Clinical Neurology
Professor
Oxford University

Diversity and Culture

LIYSF extends **further** than broadening scientific understanding, to engaging students in education on other **cultures** and **developing lasting, international friendships.**

PROGRAMME EVALUATION

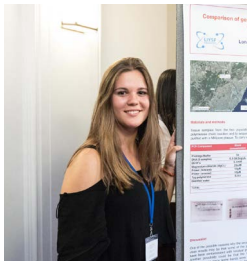


Aranza | Mexico

LIYSF helped me realise what I wanted to do with my life and it would be an honour for me to help other people do the same

Rivenaka | Sri Lanka

LIYSF showed and found me the path I was searching for, it showed me what I could become



Ona | Spain

Thank you LIYSF for showing me how when people join forces, we can achieve anything we want

Salomé | France

LIYSF was truly the most eye-opening and inspiring experience motivating me to continue my future in the sciences field

Nairuthi | India

LIYSF has given me so much. It has changed my life in many ways. It has made me more confident, more connected to science, more kind and I'm more in love with science now

Mayrina | Indonesia

LIYSF has opened so many amazing opportunities for me. I would never trade this for anything

2019 IMPACT

OVER 70 SCHOLARSHIPS GIVEN

489 STUDENTS FROM 70 COUNTRIES

50% FEMALE PRINCIPAL SPEAKERS

"Science for all religion, for all cultures, for all colours. Science is universal"

Professor Hayat Sindi, UNESCO Goodwill Ambassador & Islamic Development Bank

EVALUATING IMPACT

We are looking for help to evaluate the impact of our programme, including, design evaluation, delivery/outputs and impacts. Therefore, this initial report is limited in its scope. We have a clear understanding of our goals and activities, but are looking for help with the methodology of fully understanding the merit and worth of our event for our students, stakeholders and the wider public.

The next few pages detail some evaluation points that focus on our event.

We are seeking help to:

- Prepare an evaluation strategy to capture and understand the impact of our event
- Have clear methodology for gathering impact data
- Produce in the future a clear impact summary and pathways to impact documentation

IMPACT

LIYSF has long lasting impact on our attending students, please see case studies and testimonials included in this report. LIYSF's impact is focused on assisting in key impact areas of:

- Capacity building, creating and reinforcing new skills
- Connectivity, creating new international networks
- Knowledge production, equipping our students with key skills in STEM and communication
- Wider impact to society, looking to enhancing quality of life and championing developments in health, research, global economic performance and policy

Our work is in line with the Research Excellence Framework 2021 definition of Impact with; "an effect on, change or benefit to the economy, society, culture, public policy or services, health or the environment".

"LIYSF students harness every opportunity they get, every interaction that they make, networks are what support people and networks are what build leaders"

Dr Evelyn Gitau, African Population Health Research Center

LIYSF EVENT TARGETS

Whilst we are looking to develop further the metrics for evaluating our impact, we will look to the below targets that help us deliver our key goals, as per page 7 of this report.

EMPOWERMENT IN STEM

AIM	ACTION	CURRENT WORK	TARGET
Enable students from disadvantaged backgrounds to attend	Provide scholarships	LIYSF 2019 awarded 14 full scholarships and 59 partial scholarships	Increase full scholarships to 20 places by 2025 Increase value of partial scholarship from £400 to £500 to all partial scholarships in next three years Increase number of partial scholarships to 70 places by 2025
Have students from African continent attending	To promote and target representation from across Africa	LIYSF 2019 welcomed 9 students from 6 African countries 2018 had 18 students LIYSF provided 1 full and 4 partial scholarships to partner charity Young Scientists for Africa (YoSA)	Enhance relationship with YOSA. Look to build scholarship offer and provide 5 full scholarships by 2025 Look to new partnerships in Africa to look to increase participation from this region Target 25 students by 2025
Empower female scientists	LIYSF to have diverse female speakers contribute to the programme	LIYSF 2019 had ratio of 50% female principal speakers 31% of 2019 specialist speakers were female	Introduce tracking process of range of invites sent (final balance may not reflect efforts made for balanced representation) Look to maintain balance in plenary lectures Look to have a balance of representation in specialist lectures
Facilitate indigenous attendance	Provide scholarship and support for indigenous students to attend – many missed as not in “top” national science grading	In association with the Royal Society of New Zealand, LIYSF 2019 gave a Maori scholarship (started 2017)	Maintain Maori programme Have similar indigenous programmes in place by 2028 to support Aborigines and American Indians Research viability to support Saami students

FACILITATE AND SHOWCASE INTERNATIONAL COLLABORATION

AIM	ACTION	CURRENT WORK	TARGET
Help foster direct and in-direct impact for UK institutions	Promote, introduce and connect alumni to UK institutions. Track history of LIYSF students going on to study/work in the UK	Have example success stories, see Appendix 3 for Simran's story after attending LIYSF and LIYSF staff member for six years	Look to mechanism to capture more of these stories and translate into quantifiable impact measures

CHALLENGE STUDENTS TO THINK IN NEW WAYS

AIM	ACTION	CURRENT WORK	TARGET
Stimulate students with challenging, cutting edge material from leading world scientists who challenge and question our students.	Invest in a strong academic programme with engaging and highly respected speakers	LIYSF 2019 included Nobel prize winning opening lecture and four knighted speakers	To maintain a Nobel Prize winner lecturer annually Continue to build on current caliber of speakers

ENCOURAGE AND ENABLE NETWORKING

AIM	ACTION	CURRENT WORK	TARGET
To help foster science engagement in communities	Promote alumni to return to communities as science ambassadors. Look to empower other students and showcase opportunity	Various organisations that send students require evaluation reports and community presentations See Appendix 1,2 & 4 for student reports and case studies	Look to include a more uniform requirement for students to return as ambassadors after attending LIYSF Impact measurement process in place by 2023 Target of 50 presentations by student ambassadors in home communities following attendance. To reach target by 2025
To understand alumni pathways better and keep alumni connected	To engage with LIYSF alumni and include in the LIYSF programme. This gives students alumni role models and keeps alumni engaged	LIYSF 2019 included a specialist study day dedicated to only LIYSF alumni speakers, with eight alumni contributing. Alumni attended LIYSF in years 1964 – 2011	Maintain feature of alumni specialist study day in the programme Maintain variety of alumni speakers attending and range of years attended from Look to have an LIYSF alumni give a plenary lecture every 3 years Look to build an active alumni LIYSF community

TRAINING IN EFFECTIVE COMMUNICATION

AIM	ACTION	CURRENT WORK	TARGET
Facilitate developmental opportunities for students	Opportunities provided during LIYSF for students to actively participate and showcase their own research Professional development for alumni chosen annually to be student staff at LIYSF. LIYSF has dedicated staff training programme and gives responsibilities to staff to get professional experience	Testimonials from students of impact Staff development in Appendix 2, page 27	Look to how this can be improved and built upon further

CULTURAL INTERACTION TO ENSURE OPEN AND INFORMED WORLD CITIZENS

AIM	ACTION	CURRENT WORK	TARGET
Have diverse global representation at LIYSF	Promote and target students from a large number of counties across all six inhabited continents	LIYSF 2019 had 489 students attending from 70 countries	Maintain number of countries and mix Target of 550 students in next three years Target of 80 countries by 2025"
To have a diverse student staff team	Select a student staff team with representation across all attending regions	LIYSF 2019 had a team of 27 student staff from 17 countries across all six inhabited continents Ratio of 60% female, 40% male	Look to maintain representation from each region, despite stricter visa restrictions Look to maintain gender balance with at least 50% of staff female

"As the Head of a Sixth Form sending students to LIYSF for over 15 years, attending LIYSF has certainly helped many of our students gain places at the most prestigious of Universities and I know for many that in University entrance interviews, from their whole application they have only been asked about LIYSF!"

Lynn Hindley, Assistant Principal The Fallibroome Academy

"LIYSF enables real friendships to be formed. In my own experience, I am still in touch with people I met 30 years ago at LIYSF and there are names of people I met, that I read in the headlines, that I remember from that year. "

Mark Shuttleworth, CEO Cannonical Ltd, LIYSF Alumni, First African Civilian Astronaut

WORKPLACE & SUSTAINABILITY

We are committed to provide a rewarding environment in an efficient and sustainable way.

THE TEAM

Richard Myhill
Chief Executive

12 years' Experience as LIYSF Director - Full-time

Professor Clare Elwell
Honorary President

1985 LIYSF Alumni Advisory Role

Ojali Yusuff
Engagement Manager

2006 LIYSF Alumni Part-time Role

Guillaume Tellers
Programme Assistant

Part-time Role

- Dedicated team above work throughout the year to prepare LIYSF
- LIYSF does not have a physical office. Activity focused around LIYSF dates, where all staff are accommodated on-site throughout. Having a virtual office in London enables us to fulfill our necessary obligations without substantial office costs
- Team work remotely on flexi-time, delivering efficiently to a high standard with designated responsibilities, clear communication and regular virtual meetings
- Paperless where possible, online solutions, online student registrations, online xero accounting, remote IT provisions and support
- When we do print materials we use FSC responsibly sourced paper

SEASONAL STAFF

Emer Hickey
Chief of Student Staff

2014 LIYSF Alumni
Seasonal Role

Zach Cassar
Operations Executive

2013 LIYSF Alumni
Seasonal Role

RETURNING ALUMNI AMBASSADORS

LIYSF is staffed each year by former LIYSF participants, who act as counsellors and to facilitate, supervise and deliver the programme. This fosters an inclusive environment for attending students to meet with persons that have been in their shoes. LIYSF has a tiered strategy to allow staff to return for a number of years and progress in seniority and responsibility. This empowers staff and builds key personal and business skills.

Each alumni commits 19 full days to be a staff member over our event dates, with training.

PARTNERS

LIYSF has established worldwide partnerships to enhance the scope and reach of our work, carefully choosing those whose values are aligned with empowering young scientists and have a proven track record of delivering impact. A full list of our partners can be found in Appendix 7.

ACCREDITATIONS

Independent accreditation is important to LIYSF to maintain the highest possible standards across our organisation. We are an ABTOT bonded organisation and are working with tranquilico to present an independently verified safety accreditation for our operations. We are also applying for the Social Enterprise Mark.

FUTURE

It is an exciting time as LIYSF moves forward as a social enterprise. This is about investing in the future, to build a sustainable platform for the long-term. However, the impact of COVID-19 is likely to be substantial, affecting the ability and appetite for international travel. This will impact our work in the coming years and will require substantial work to maintain the current levels and impact of LIYSF.

We look to the future in delivering more transparent and accountable impact in a sustainable format. Over the cycle 20/21 there is considerable work to bed in the new standalone operation, communicate change and maximise the opportunities that lie in current networks from our new legal structure. We will also look to consider how we can best measure the impact of LIYSF, to have more data and understanding of our impact. We will see professional advice and research to help us.

Our primary impact goal is to enhance our scholarship scheme, that looks to fund students from under-privileged students to attend, that would not otherwise have such enrichment opportunities. The primary focus

of the scheme will look to support African, South American and female science students, both directly and through partners like YoSA.

These are challenging times for any organisation, for LIYSF there are a number of challenges that we face after postponing the 62nd LIYSF from 2020 to 2021, due to COVID-19. Also in 2020, transitioning to a CIC, having undertaken a substantial loan to take LIYSF out of private ownership from ECE Travel. These factors mean that loan repayments - to cover both the market sale price and the 2020 overhead costs - will impact the available funds that can be reinvested for our social purpose, for the coming 6-8 years. However, despite this short-term limitation we will continue our scholarship support and build on the support given at a gradual rate. We are grateful to have the support and help of an angel loan provider to help us, as well as looking to new possibilities open to us, now we are a CIC.

As always, it is our students that inspire us, to empower passionate individuals to reach their potential and positively impact society. This is exemplified best by LIYSF alumni (through YoSA scholarship) and three-year staff member, Ammy:

"I want to go out there and tell them that with education we can get somewhere. With science we can get somewhere. I want to go and open their eyes like my eyes were opened in this forum and show others that we can get everywhere, we only have to have the strength, the will, and we can get there if we want to"

Ammy Dama, Kenya, LIYSF participant and staff member.

APPENDIX 1

KATIE'S EXPERIENCE

From 24th July to 7th August 2019, I attended the London International Youth Science Forum (LIYSF). These two weeks were some of the best of my life. I would like to explain the main things I have learnt and the highlights for me.

Firstly, the lectures we attended were world class and very thought provoking. I was inspired by the lecturers' passion and enthusiasm for their subject. The plenary lectures opened my eyes to different disciplines in science that I had never heard of before, and I am now interested in, such as quantum biology. The specialist lectures that I chose were fascinating and it was incredible to be in small groups discussing research with professors and being able to ask questions. We attended visits to scientific institutions and research labs, the first time I have seen a proper research laboratory. It was fascinating to see the facilities and ask PhD students about their research. From all of these opportunities, I have learnt a great deal, the main points I will explain now.

From the visits to research facilities, I learnt how interdisciplinary research is. Before, I did not appreciate that a research team consisted of members from many different fields all working towards a common goal. For example, in the Wellcome Genome Campus, in the team that sequence genomes, there were computer scientists,

well as geneticists. This inspired me to learn that I can use my passion for all the sciences in whichever field I choose, despite it being a specialised field.

At these research institutes, I also discovered that research is incredibly international. The research teams had members from all over the world and plenary lecturers explained how they travelled the world to participate in different research. This highlighted to me the importance of international collaboration in science and the importance in cultural diversity to give different perspectives. This need for international collaboration was met perfectly by the participants of the Forum from 77 different countries.

Before the Forum, I thought that when something was discovered, it was proven and then the members of the scientific community all agreed on the facts. I discovered at the Forum that this was not the case, to my surprise. There is still a lot that we do not understand and there is still debate between professors over the facts. Before, I believed what a professor said, but now I realise that many have contradictory views, and I must analyse their arguments more and not just believe what I hear.

The lectures and visits helped me decide what field I would like to pursue in the future. Before the Forum, I wanted to study medicine and eventually become a clinician, but I had an interest in medical physics and hoped the Forum would be a "lightbulb" moment for me. From the Forum, I have realised I really enjoy biochemistry and molecular biology, particularly immunology and stem cell research. I will still study medicine but I will choose a university that has extensive opportunities for research.

On top of the academic side of the Forum, the social side was also very important. Although I knew I would be meeting people from all over the world, I didn't fully appreciate the impact it would have on my understanding of different cultures.

The social side of LIYSF developed my confidence drastically, by meeting lots of people who like me, loved science but were very different in many other ways. I presented and fed back to a lecture theatre containing 560 people, which I would never have done before. I am more confident meeting new people and talking to professors.

At LIYSF, I enjoyed telling everyone about the Guernsey culture and felt very patriotic. I felt privileged to represent my island at this international event. Teaching my friends the Bebe and showing them Sarnia Cherie, a scoop and a Guernsey jumper was great fun.

The cultural diversity at the Forum broadened my horizons more than I could have imagined, which I am very grateful for. I have learnt lots about different countries that I had never really heard of before. This helped me understand different ways of life and different cultures, looking at things with different perspectives. It showed me the importance of diversity in all aspects of life, something I will miss on our small island. I am very grateful to have met such a diverse, kind and intelligent group of people.

For me, the best part of LIYSF was making lots of new friends, many of whom I hope will be life-ling friends. I already am trying to plan a holiday to India, to visit friends and meet others from Australia and New Zealand halfway. Below, I have included pictures of some of my new friends.

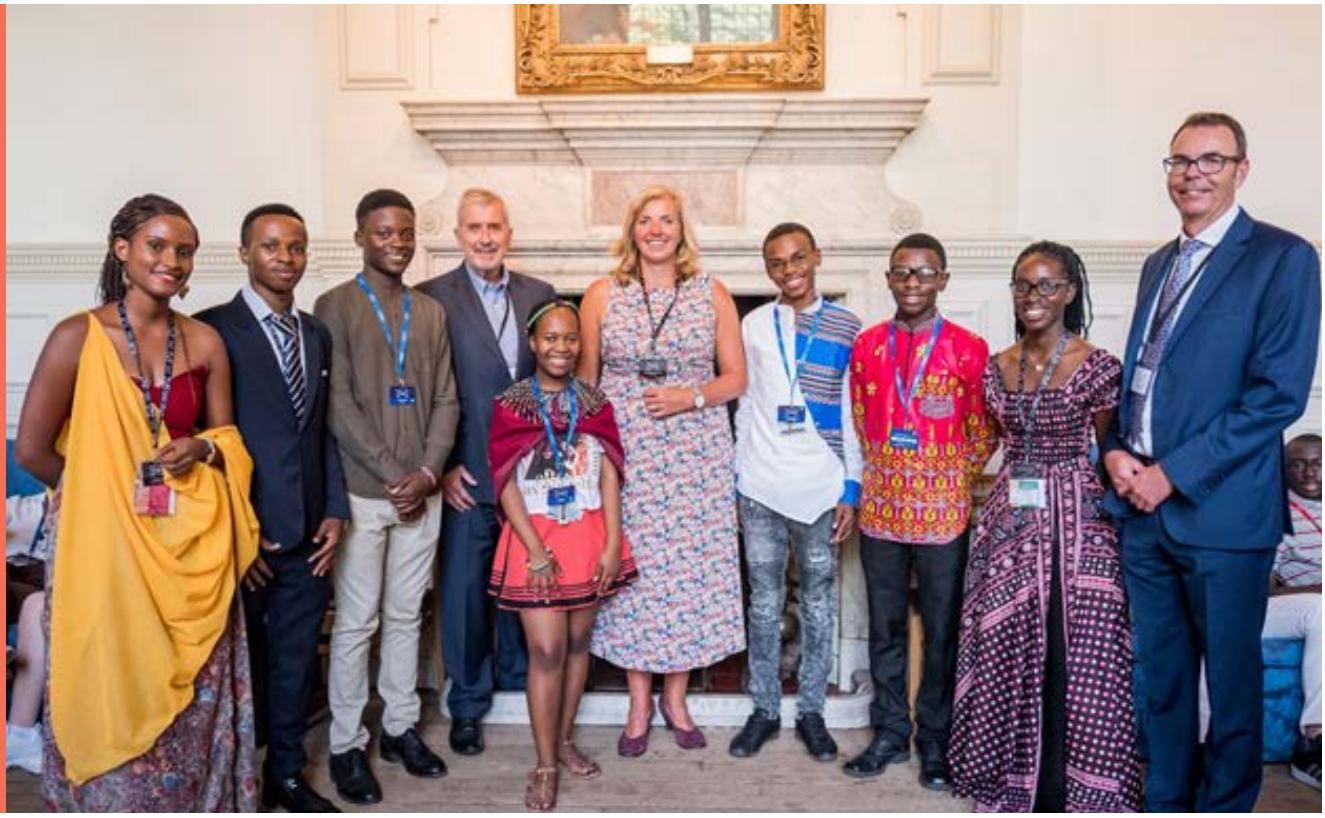
Specialist visit to King's College London's Centre for Stem Cells and Regenerative Medicine, with friends from Australia, New Zealand, Jamaica, Cyprus, Greece, India and Brazil:

Friends from Spain, UAE, Australia, Jamaica, Brazil, New Zealand and China

My friends from India in Prince's Gardens (above)

APPENDIX 2

AFRICAN STUDENT REPORTS YOUNG SCIENTISTS FOR AFRICA



PHAMELA

After the experience I had at LIYSF I got home and I was full of knowledge and wanted to do more for my community so together with my friends we started/formed a little project that aims to help children especially the ones who are in Primary School with their studies. Our project started in September and from then we've had about 10 classes with them and I've never been so excited about teaching children Science and Mathematics. We have also spoken to their teachers and they are grateful for what we are doing for the students and they are already seeing the difference in their grades. Our aim is to make sure that each and every student understands the importance of Science and they know that it's not as hard as it seems Our aim is for them to choose Science when they get to High School and hopefully increase the number of students that do Science. I just graduated from High School and I'm still writing my final exams so everything has been so hectic but I hope it will be worth it. I have also been asked to make a speech next year January to motivate the "Class of 2020 Year 12" and I have never been more excited. The experience I got from LIYSF has shown

me that there is nothing I can't do in life and through Science I can change the world. After my exams I really hope I can figure out a way to continue with my research and possibly finding a cure for cancer though I know it will take time but I'm up for the challenge. I would love to thank YoSA for the amazing opportunity and I'll forever be grateful for it..

MACDONALD

After LIYSF, I started working on improving my project using the feedback and advice I received from the Poster presentation, Famelab and also from some of the lectures. I was selected to be part of the Climate Change program by Unicef Zimbabwe and Voices for Youth in September. I was also awarded the Green Innovations Award by SNV Zimbabwe. In October I was awarded the First-place award in the Physical Science Category by the Young Scientist Journal. I am currently on a scholarship at Africa Leadership Academy doing a two year program on Entrepreneurial and Leadership studies. I intend to study Biomedical Engineering for my undergraduate after my gap year.

CLEMENT

The year 2019 has been very eventful even though I did not attend the 61st edition of LIYSF. This year, I had an opportunity to go back and talk to a group of 150 students during the high school symposium organized by Kemri-Wellcome Trust: School engagement program. I felt that the students had a nice opportunity to listen to a person who had attended LIYSF and also doing a science-related course. During the symposium, we had an opportunity to talk about the various impacts that science has had in society and what else it could bring about. We also had an interactive session on the development of science and the future direction it is taking. Furthermore, we talked about the opportunities that one could have and also the impact London International Youth Science Forum (LIYSF) had on me as a science student.

I also got an opportunity to go back to my high school and talk to The Science and Robotics club. This is a club that primarily does research and projects that involve science. Since LIYSF allowed us to listen to a variety of lectures, this helped me have a bigger impact on their projects. The club boasts of a group of around 60 students. It was a fun and interactive session.

Finally, I had a session with my classmates at the university about the opportunities for the future for those of us in the science career path. We talked about the immediate impact of our path on science and not just the global impact and also the local impact of it. Moreover, we brought forth the ideas of interdisciplinary projects to bridge some problems in Africa such as Food insecurity and climate change. For me, the goal has been to learn and to develop the ideas that I have to bring forth better ideas.

TONYARADZWA

As a volunteer mathematics tutor for a local children's home, I developed a deeper insight into Science Communication. I ensured that the students did most of the teaching in the lesson, keeping my involvement minimal, as my method of teaching emphasized on the students communicating, not with me, but with each other. The technique turned out to be vital in having the students fully grasp abstruse concepts.

I was delighted to be on the team that coordinated the Africa Science Buskers Festival under Zimbabwe Science Fair in July. While assisting in deciding the winners for specific awards, I found myself inspired by the young scientists' highly innovative science projects and this has rejuvenated my hope for development of STEM in Zimbabwe and Africa.

Currently, I help students who need guidance on their science projects and in accessing opportunities in the STEM field. I look forward to volunteering for Zimbabwe Science Fair again for next year's science events and to continue emphasizing on Science Communication.

GRACIOUS

I am currently an engineering student at Daresalaam Institute of Technology in Tanzania. I received the YoSA (Young Scientist for Africa) scholarship on 2018 as the Tanzanian representative to participate in the London international Youth Science Forum, and was selected as Staff to LIYSF in 2019. As an innovator it was an opportunity for me to learn further on the advancement in technology and how to communicate science, also to network and explore more opportunities, and to share what I learnt in my home country.

Through Young Scientist for Africa, I was linked by Clare Elwell to Fredros Okumu, the director of Ifakara Health Institute, it was a privilege to explore new opportunities in health as an implementation of interdisciplinary perspective emphasised in the forum, and we discussed with Fredros and found various opportunities for me to partner with the Ifakara Health Institute.

After attending an innovation workshop in April 2019 by Ifakara institute, I got the opportunity where I received startup funds to initiate a start up of producing automated mosquito nets, which was an idea I presented as a prototype in the workshop, where the idea was a net that worked automatically in folds the net after detecting human presence and unfolds when one wants to get out of the bed.

Since I won the funds in April 2019, I had not yet developed a real Automated bed net prototype that works perfectly and can be used by customers, and it took me some time to develop a real customer version of the net because I had also to cope with my university studies.

I finally completed the first design of the customer version in October this year. It's a great step that will result to replication of the prototype to be used by customers which will revolutionize bed nets in Tanzania.

GEORGE

The London International Youth Science Forum left a large impression in my life. It helped sharpen by scientific skills. It instilled me with the urge to continue researching and searching for solutions to some of the world's greatest problems. I have also maintained all those networks and friendships that I created during the forum.

Being a YoSA ambassador I have helped motivate several youths from my country about the benefits of science and encouraged other students to work hard in school and also come up with brilliant inventions and innovations that can help the society in general, in so doing made the spirit of science immortal. I'm still working on my study on how to reduce the rate of infant mortality in sub saharan Africa by studying the level of sterility of breast milk.

I'm currently a first year student at the University of Nairobi pursuing a degree in environmental and Biosystems engineering. I also applied to Brighton university in the UK, and got accepted to pursue mechanical engineering. I'm looking forward to studying at Brighton if I get the necessary funding.

EDZANI

First of all I would like to thank YoSA for giving me a chance to explore and learn more about science and also increasing my self esteem. At first I was not able to talk in front of the large crowd but now I can do so with confidence and joy.

After the forum I got a chance to present to my fellow students about my LIYSF experience and I am glad to inform you that the number of students was 2,536 and not to forget that this was the first time I got to speak in front of such a big crowd. I also did another presentation in front of my teachers.

Right now I am thinking of innovating some project bigger and smarter than my first project and I am currently looking for funding for the same so that i can achieve my dreams and also spreading the name of YoSA everywhere I go.

I have a dream of either becoming a doctor a mechanical engineer. If I happen to become a doctor I will still continue with my dreams of innovation and if I do mechanical engineering i will be very deep into innovation at the University of Cape Town. If I go to Sefako Makgatho University (SMU) I would be having one option of being a doctor .

I have three goals for next year the short term goal, medium term goal, and long term goal. my short term goal is to go to London again to be a staff member and for more learning, my medium term goal is to find sponsors to help me with my innovations ,my long term goal is to become a doctor or a mechanical engineer.

AMMY

I was lucky enough to get another chance to attend the London International Youth Science Forum as a staff member. It goes without say that this opportunity has bettered my leadership skills, the interaction with other international staff members has taught me to work with different people to achieve a common goal and through the various lectures I got to attend I strongly believe science can work wonders in solving world problems.

I have been very busy with school work and currently waiting to sit my final exams. I will be doing my clinicals (attachment) for two months as from February. I am also waiting to start my CPA (Certified Public Accountant) studies in January next year.

I strongly believe that change can take place in Africa and the change begins with me.

CHRISTA

A few days after I got home from the 61st London international Youth Science Forum, I got to know that the Managing director of the company I work for was moving to the US with his family. He therefore proposed me as his replacement to better my skills.

I am honored to let you know that I am now the COO and responsible pharmacist of FLR Rwanda that does importation and distribution of paramedical products and soon medical products.

On top of that I am still representing Topicrem in Rwanda. I still have a lot learn from my new job, strongly looking forward for what the future will bring us as we are still a growing company.

As it is my first time to have a managerial position in my career, I had to seek for knowledge to support my work, so i decided to start a master degree in business Administration in September at the Mount Kenya University, soon finishing my first semester. The course I'm taking is already being of great help in career. I work from Monday to Friday then study on Saturday to sunday.

I still hope that I will be able to continue my health science studies when the opportunity comes around.

PANASHE

Over the August public holidays, my family and I engaged in a feed the poor campaign. We went around Harare feeding the homeless, the starving and the street kids. We managed to feed over 70 people with food we had cooked from home and also giving them clean water to drink. It really felt good impacting the community positively and putting smiles on other human beings.

For my education since finishing high school I have taken time deciding my future whilst exploring the world and its endless possibilities. I have friends I met in LIYSF who have given me endless advice and support. As a technology fanatic who wants to venture in software engineering I found Germany as the right place for me to be. Right now I have applied at Ravensburg Weingarten University of Applied Sciences wishing to start school this coming year. I have applied for Social Voluntary Service in Germany to familiarize myself with their culture , language and lifestyle as I wait to start school. Never thought I would learn other languages but learning new languages has now become something I'm interested in ever since learning Deutsch. I am certified B1 level German language speaker. I have applied for a Visa to go start my Voluntary Service but still waiting for a decision from the Embassy.

Being part of YoSA has given me direction and a purpose in my life. When I see myself, I see the future of Africa and I always strive to be a better person each day.

YOSA STUDENTS

Because YoSA cannot take all young scientists to London, we make it our business to bring LIYSF to Africa. And because of YoSA we are moving to greater heights.

APPENDIX 3

GREAT VISIT BRITAIN MAGAZINE 2017

INNOVATION

Always INNOVATE

Do you dream of entering a brave new world of possibilities to explore your passion for science, engineering or technology? Then Britain is the place to study

London is the best city in the world for businesses and individuals in search of opportunities – that's according to the *Cities of Opportunity* study published by PricewaterhouseCoopers in 2016.

Britain has a long history of science, industry and entrepreneurship; it is the home of prestigious organisations such as The Royal Society and forges scientific partnerships across the world. British universities have played their part by attracting high-calibre students from around the globe and guiding exceptional talent into key industries.

Loughborough University, in Leicestershire, central England, is one such institution that has a global reputation for excellence in science and technology research, with over 100 research centres, groups and institutes.

Loughborough's reputation is founded on research driven by society's need to address real-life issues. 'We have well-established partnerships with business and industry, and commercial potential is at the centre of much of what we do,' says Professor Robert Allison, the Vice-Chancellor and President. 'We want to ensure that our students gain the skills and experience they need to either start up their own companies or to help them as they move into the world of business or industry.

'Our international students come from all over the world, attracted by the quality of the education that we offer and our strong community feel.'

FIND MORE ONLINE
including your UK study options and how to apply
study-UK.britishcouncil.org

NEW TECHNOLOGY

Simran Mohnani, 20, came from Malta to study chemical engineering at University of Bath. Here's why...

I was always excited by the prospect of studying at a UK university because of their reputation for acclaimed scientific contributions, industrial connections and multicultural diversity. However, the idea of leaving my home, family and friends back in Malta, where university is free of charge for all undergraduate students, made it a difficult decision for me.

The turning point came on a trip to the UK one summer as part of the London International Youth Science Forum (see overleaf for more). It was during a visit to the Department of Chemical Engineering at Imperial College London that I got my first insight into the subject.

The research was so different from anything I had seen before – I learnt about pilot plants to store CO_2 underground, and the production of artificial blood for regenerative medical purposes. This ignited my passion for wanting to help the environment and the human race, and it was then that I made up my mind to apply to the UK to study chemical engineering.

I'm now in my third year of the MEng (Hons) Chemical Engineering course at the University of Bath in south-west England. Studying in the UK has opened up a world of opportunities for me. My university has amazing connections to industrial companies – we have been lectured by safety engineers from ExxonMobil and have frequent access to careers fairs. Another attraction of the UK is the support for female Science, Technology, Engineering and Mathematics (STEM) students. Chemical engineering is still a largely male-dominated profession but I have had the chance to attend workshops on women in leadership and to speak to women scientists.

Our department also offers the chance to conduct a research project abroad through connections with universities across the world, including Australia, New Zealand, France and Germany. After graduation, I hope to study for an MBA. I'm aiming for a managerial position where I can influence global change. Chemical engineers will be key in developing the technologies of the future such as sustainable energy, biomedical and biotechnological products. Building my own start-up some day is a dream I keep close to my heart.

My advice to students hoping to study science in the UK is to just go for it, however competitive it may seem. The global interactions, industrial connections and diverse outlook have taught me more than I could ever have imagined. ›

'MY UNIVERSITY HAS AMAZING CONNECTIONS TO INDUSTRIAL COMPANIES'

VICHOS Lucio Dorr/
PHOTOGRAPHY Prof Louis Gould, Getty

Become part of UK innovation

LEADERS OF THE FUTURE

Launched in 1983, the **Chevening Scholarships** programme is an international scholarship scheme that enables students with leadership qualities from 144 countries and territories to undertake postgraduate study or courses in UK universities. It is funded by the Foreign and Commonwealth Office and aims to build a network of future leaders, influencers and decision-makers across the world. Recipients are personally selected by British Embassies and High Commissions around the globe. ***chevening.org***

SCIENCE FOR THE YOUNG

Founded in 1959, the annual **London International Youth Science Forum** is a two-week residential event held in the heart of London. Its aim is to unite outstanding talent from all nations and provide a deeper insight into science and its applications for the benefit of all mankind.

The forum attracts 500 of the globe's leading young scientists, aged 17-21, from over 65 countries. Along with an active social calendar and a focus on cultural education and forming lasting friendships, the programme includes lectures, demonstrations from leading scientists and visits to industrial sites, research centres, scientific institutions, world-class laboratories and universities.

In 2017, it takes place 26 July to 9 August, and applications are open until the end of May. ***liysf.org.uk***

YOUR OWN BUSINESS!

If you come to a UK university to study and develop a highly innovative idea and/or strong entrepreneurial skills, the **Tier 1 (Graduate Entrepreneur) visa** allows you to stay in the UK to develop your business. It is the first initiative of its kind in the world, and there are currently around 100 UK universities taking part.

You can apply for this visa if you:

- are a graduate who has been officially endorsed by the UK's Department for International Trade (DIT) or an authorised UK higher education institute as having a genuine and credible business idea
- are from outside the European Economic Area and Switzerland
- meet other eligibility criteria

The Tier 1 (Graduate Entrepreneur) visa is initially valid for one year, but can be extended for a second year. Following these two years you can apply to switch to a Tier 1 (Entrepreneur) visa, which allows you to stay for up to three more years in order to develop a business within the UK..

FIND MORE ONLINE
Visit gov.uk and search for 'Graduate Entrepreneur'

APPENDIX 4

YOSA SPOTLIGHT

MACDONALD CHIRARA

Following their experiences with Young Scientists for Africa (YoSA) and the London International Youth Science Forum (LIYSF), our students go from strength to strength, developing their passion for science and benefiting their African communities. A perfect example of this is 2019 YoSA Clare Elwell Scholarship winner, Macdonald Chiara, from the small town of Marondera in Zimbabwe. In his developing community, STEM subjects are yet to receive the status they deserve, meaning this gifted student earned himself a once in a lifetime opportunity with YoSA.

Macdonald was introduced to YoSA by fellow Zimbabwean alumni, Tonyaradzwa 'Tonya' Chivandire. As a result of her experiences in the UK, she also continues to succeed in science in Africa. Tonya was Macdonald's teammate at the Intel International Science and Engineering Fair. Their partnership is testament to the strength of YoSA and LIYSF in creating long-lasting bonds based on scientific study and discovery.

"Being selected as the flag bearer of my country at the opening ceremony of LIYSF was one of the greatest honours that has ever been bestowed upon me. Over the two weeks, I attended incredible lectures from some of the world's leading professors and visited some of the most exclusive and prestigious research labs that I had only seen on TV or read about in books."

Prior to attending LIYSF, Macdonald's impressive résumé boasted multiple prestigious awards, including the 'SNV Netherlands Development Organisation Green Innovation Award' and 'The Society for Science and Public Community Innovation Award'. Both were won for his 'Smart Household' portable system, which uses any organic waste to generate electricity and cooking gas (biogas) – a particularly important innovation in his poorly-resourced home setting.

During the Forum, Macdonald was introduced to a world of interdisciplinary and collaborative science, with different cultures and traditions meeting, often for the first time. He was chosen to profile his research, titled 'Electricity from Water Hyacinth Enhanced Biogas Production' at LIYSF's FameLab session. Macdonald explained that this experience was essential for his personal and professional development; he came away with new skills to concisely present his science to a general audience. Using these skills, he later re-presented his project and won first-place in the 'Remote Poster Competition – Physical Science Category' of the 'Young Scientist Journal'.

Recently, Macdonald received a scholarship to continue his studies at the prestigious Africa Leadership Academy, in South Africa. The program is geared toward young African leaders with the potential to catalyse positive change on the continent. At the end of the program, Macdonald plans to study Biomedical Engineering. By using his passion for the integration of technology into the healthcare sector, this young scientist's ultimate goal is to improve the quality and effectiveness of patient care in his African community.

APPENDIX 5

ACADEMIC ALUMNI SPOTLIGHT
PROFESSOR CLARE ELWELL

Vice-Dean for Impact and Professor of Medical Physics Department of Medical Physics and Biomedical Engineering University College London (UCL)

Clare Elwell is a Professor of Medical Physics in the Department of Medical Physics and Biomedical Engineering at University College London (UCL). She studied Maths, Physics and Chemistry at A level and in 1984 was sponsored to attend LIYSF. It was at LIYSF that she attended a lecture about Medical Physics and it was this experience that inspired her to study this subject at university. She obtained her BSc. in Physics with Medical Physics in 1988 from the University of Exeter, where she also completed her MPhil (1991). She gained a PhD from UCL in 1995 describing the application of near infrared spectroscopy (NIRS) to measurements of brain oxygenation and blood flow in adults. She is now Director of the Near Infrared Spectroscopy Research Group in the Biomedical Optics Research Laboratory at UCL and holds honorary positions at University College London Hospital, the National Hospital for Neurology and Neurosurgery, University of Essex and Birkbeck, University of London. She develops novel optical systems for monitoring and imaging the human body. Her research projects include studies of autism, acute brain injury in adults, children and infants, sports performance, migraine and malaria.

Her most recent project is the use of near infrared spectroscopy to investigate malnutrition related brain development in rural Gambia, resulting in the first functional brain imaging of infants in Africa. She started the Globalfnirs initiative (www.globalfnirs.org) to support the application of NIRS in global health projects. She currently leads the Brain Imaging for Global Health (BRIGHT) project which is developing brain function for age curves for Gambian and UK infants from birth to 24 months of age with the aim of informing targeted interventions to improve long term neurocognitive outcome.

Her research is supported by the Engineering and Physical Sciences Research Council, Medical Research Council, Wellcome Trust, Bill and Melinda Gates Foundation and industrial collaborators Hamamatsu Photonics and Hitachi Medical Systems.

She is a founder member and President of the Society for Functional Near Infrared Spectroscopy, and President of the London International Youth Science Forum. She is Founder and Trustee of the charity Young Scientists for Africa (YoSA, www.yosa.org.uk).

She is also President of the London International Youth Science Forum (LIYSF).

Clare has won the 2016 WISE Research Award, sponsored by Winton Capital. WISE inspires girls and women to study and build careers using science, technology, engineering and maths (STEM). This award recognises the world leading research that Clare has carried out using novel optical imaging techniques to understand the human brain in health and disease.

Clare has also won the UCL Provost's Public Engagement Award, Medical Research Council Science Suffrage Award, Inspirational Teacher Award at the UK Inspirational Awards for Women and the Women in Science and Engineering Research Award. Most recently she was awarded the UCL Engineering Engagement Outstanding Contribution Award and a British Science Association Media Fellowship to work with the Financial Times in London.

APPENDIX 6

ACADEMIC ALUMNI SPOTLIGHT

PROFESSOR RICHARD O'KENNEDY

Professor Richard O'Kennedy is Vice-President for Research Development and Innovation at the Qatar Foundation. He is Science Patron of LIYSF and LIYSF Past President as well as attending LIYSF as a participant in 1972. He is former Vice-President, Teaching and Learning at Dublin City University.

After attending LIYSF in 1972, he was invited back as a 'Counsellor' in 1973. After that he was host of a Hall of Residence (College Hall in Malet St; part of the University of London) for 10 years. Subsequently he was a member of the Advisory Committee on the programme, a lecturer and gave both the opening and closing lectures over a period of 18 years. He was invited to be LIYSF President, the first past-participant to hold that position (2005 – 2017).

Richard describes LIYSF as "A really vibrant community of young scientists open to new ideas and having the opportunity for informed debates on key scientific challenges. This can lead to significant career opportunities, the future capability of significantly impacting international scientific activities and improving the world in many important areas!"

He is also Vice-President, Research at the Hamad Bin Khalifa University, Doha, Qatar. He has served as; the Director/ Scientific Director- Biomedical Diagnostic Institute at Dublin City; Vice-President, Teaching and Learning, Dublin City University; Professor of Biological Sciences, Employer: Dublin City University; Head of School of Biotechnology, Dublin City University and Visiting Research Scientist – MD Anderson Cancer Center, University of Texas.

Affiliations and Additional Roles

1980-present	Member, Fellow, Council Member, Secretary and President (2016-17), Institute of Biology of Ireland.
2014- present	Member, Royal Irish Academy. Fellow, Royal Society of Biology.
2017-present	Chair of the Scientific Board, Glycoselect, Ireland.
2017- present	Adjunct Professor, Dublin City University.
2018-present	Chairman of the Board, Qatar Science and Technology Holding Co.
2019- present	Member, Joint Advisory Board Weill Cornell University, Qatar.
2019- present	Joint Chair, Board of University College London at Qatar.
2019-present	Member, Research Advisory Board SIDRA Hospital, Qatar.

2020- present	Chairman of the Board, Qatar Science and Technology Park.
2018-present	Member, Research, Development and Innovation Council, Qatar. Developed Qatar's National Policy for Research and Innovation
1978 – present	Member of the Biochemical Society.
2018	Founder, Qatar Research Cooperative Consensus

DETAILS OF MOST RELEVANT RESEARCH FUNDING AS LEAD/CO-APPLICANT

Project	Funding Scheme	Duration	Value
IvP	SFI & DEL(NI)	2015-20	€1,000,000
DPTC	EI/Industry	2015-20	€72,000
RECANT	EI/Industry	2015-17	€310,000
Colorectal Ca	EI/Industry	2014-16	€160,000
PROSENSE	EU Marie Curie ITN	2013-17	€450,000
Prostate Ca	Irish Cancer Society	2012-15	€100,000
BioliSME II	FP7 EU/SME	2012-15	€136,000
BDI	SFI	2010-15	€14,500,000
Immunodiagnostics	Irish Research Council	2010-18	€300,000
Immunodiagnostics	China Scholarship Programme	2010-15	€100,000

"LIYSF forms a really vibrant community of young scientists open to new ideas and having the opportunity for informed debates on key scientific challenges. This can lead to significant career opportunities, the future capability of significantly impacting international scientific activities and improving the world in many important areas! "

Professor Richard O'Kennedy, LIYSF Science Patron and Alumni

APPENDIX 7

OFFICIAL LIYSF PARTNERS

In addition to schools and universities across the world, LIYSF is proud to work in association with many world-wide organisations, including:

- UNESCO
- Imperial College London
- British Council, both UK and worldwide offices
- Study UK, GREAT Britain Campaign and No.10 Downing Street
- The British Science Association
- Engineering UK and the Big Bang Fair
- Young Scientists for Africa
- European Contest for Young Scientists
- Society for Science and the Public USA
- South African Agency for Science & Technology Advancement
- Swedish Federation of Young Scientists
- RED Science Network Mexico
- Calouste Gulbenkian Foundation
- Technology and Innovation Austria
- The Research Council of Norway
- The Research Council of Oman
- National Youth Science Forum Australia
- MILSET
- Barcelona International Youth Science Challenge and the La Pedrera Foundation
- Qatar Foundation
- ASDAN China
- The Royal Society of New Zealand
- Youth Science Canada
- National Ministries of Education in UAE, Pakistan, Bangladesh and Taiwan
- Swiss Youth Science Forum
- Stiftung Jugend Forscht Germany
- Korea Science Service
- MOSTRATEC Brazil
- Association Jeunes Scientifiques Luxembourg
- BT Young Scientist and Technology Award of the Year Ireland
- FAST National Science Association Italy
- China Association for Science and Technology
- Cyprus Research Promotion Foundation
- The Rotary National Science Forum New Zealand
- Hungarian Association for Innovation
- Various county councils across the UK
- REDE POC Science Network Brazil
- Youth Science Chile
- OKSEF Turkey
- Pakistan Science Foundation
- Polish Children's Fund
- The Royal Geographical Society

APPENDIX 8

HONORARY PRESIDENTS OF LIYSF

1959 – 1962	The Rt Hon Lord Nathan
1963 – 1967	Sir John Cockcroft
1968 – 1969	Sir Lawrence Bragg
1970 – 1971	Dame Kathleen Lonsdale
1972 – 1974	Professor Sir Joseph Rotblat
1975 – 1979	Professor Sir Hermann Bondi
1980 – 1982	The Rt Hon Lord Ritchie Calder
1983 – 1986	The Rt Hon Lord Briggs
1987 – 1989	The Rt Hon Lord Porter
1990 – 1993	Sir John Meurig Thomas
1994 – 2004	Professor Brian FG Johnson
2005 – 2017	Professor Richard O'Kennedy
2018 – Present	Professor Clare Elwell