The LIP Internship Program

— The first 5 years —

Nuno Leonardo (LIP), Program Coordinator

The Internship Program is the Lab's flagship initiative for undergraduate students. The program is LIP-wide, involving all three nodes, and all research lines and groups. The participating students acquire initial common training, become integrated in research teams over a period of up to two months, and present their work at a final workshop. The successful organisation and the paradigm established result in the demonstrated sustainability of the program. It has been held annually, since 2017, over the Summer period. It has attracted the interest of students since it started, and in a sustained fashion, with a record number of candidates received in the most recent edition. Over its first five editions, it enrolled over 300 students involving about 200 projects. The program has successfully achieved the goal of rendering LIP and its research widely known to physics students at the different universities. It has been systematically providing advanced training, facilitating both technical and soft skills, in a collaborative environment, to university students, with some of them pursuing further research with the Lab, in the context of courses and theses. The program has been run on a zero-€ budget, free-of-cost for participants, and based on the collaborative involvement of the researchers and structures at LIP.

Objectives

The primary goal of the program is to engage university students in research at LIP.

Associated goals of the LIP Internship Program (LIP.IP) involve **outreach** of the brand LIP amongst university students, and beyond, and the dissemination of particle physics and the broader LIP research activities. Introducing students to research, and facilitate **education** on the research field and tools. Acquainting students to **communication** of research topics and results to peers.

Secondary goals involve the training of successive generations of participating university students through hands-on research work, implying the acquisition of specific and transverse skills, technical and beyond, useful for their academic and professional careers, complementing the classical university education. The program is Lab-wide, and promotes the collaboration and integration of its researchers, across regions, research lines and groups. The program further facilitates teaching and tutoring experience, including to LIP masters and doctoral students, as well as coordination opportunities and skills, to all LIP researchers.

Motivation and historical view

The program has appeared following the realisation that LIP and its research were at the time insufficiently known to university students in physics. Such a situation was wholly unexpected (definitely so to the author of this report) and at odds with the dynamic research being carried at the Lab. It was nonetheless systematically verified. Causes could be multiple, and included the lack of connection of the majority of LIP researchers to the universities and thus to students. And it reflected unfavourably in the ability to attract students to the broad research being carried at the Lab. That was clearly a rather serious shortcoming, critical to the activities and future of the Lab, that thus needed addressing.

Prior to 2017, there were potentially isolated instances of individual researchers who would, when available, tutor a few students. This could be in connection with some course they taught at a given university, or in the context of some initiative at a given department, or by a few groups possibly with stronger connection to a specific university. In the year of 2016 there was a noticeable evolution, stemming in part from student initiatives. This was the case for example in Lisbon, when students from IST organized visits to research centres. Such student-driven initiatives turned out to be considerably more attended than prior initiatives made by LIP groups going to the universities. They effectively provided an initial means of contact between LIP researchers and students. That summer several students came to LIP, in the context of internships organised by few individual groups. In view of that very successful experience, it was natural to attempt to organise a broader initiative. This was done in the following year, with the first edition of the program.

In 2018, with the 2nd edition, the LIP-wide program was established. It now involved all LIP nodes. And while in the 1st edition the organisation was around research groups, it now became centred on the researchers (i.e. projects are not offered by individual groups but by one or more researchers, with one main supervisor per project). An outreach effort was organised, leading to increased participation. Following the success of the first editions, the program became sufficiently known to students, who then effectively served as enthusiastic promoters to peers. The baseline structure of the program was then established. In every edition, nonetheless, novel ideas and innovations were

systematically experimented and incorporated. Students' inputs were considered and addressed. Later, the onset of the pandemic in 2020 brought about unexpected challenge and uncertainty, which were met with further innovation. The adoption of online collaborating tools was successfully explored, and incorporated also in upcoming editions. The LIP.IP program has not only continued, and with the same baseline structure and organisation, but it persevered, even with increased participation, and with its sustainability thus further reinforced.

The above mentioned issue, of the lack of familiarity and attractiveness of LIP to students, has been thus resolved. Which reflects also in the considerably larger number of masters and doctoral students the Lab has been attracting in the more recent years.

Implementation

The execution of the program involves multiple facets, starting from attracting students to learn about particle physics and associated technologies and the collaborative international environment of the research field. Providing baseline training to the participants, before being integrated in research projects (for the duration of the program). Facilitating scientific discussion amongst students and researchers. Communicating the topic and the results achieved in scientific workshops and via student research papers.

Outreach

The announcement and dissemination of the program — and therefore of LIP — is pursued through multiple outreach channels. These are carried out locally, at the universities, through presentation sessions, posters in printed of digital formats, disseminated through Department or University resources, institutional and student mailing lists, and centrally such as via LIP web pages and social media.

Initially the larger focus was placed on actions held locally, with multiple presentation sessions at several universities nearest to the LIP nodes. The LIP program has been also systematically announced along with related programs organised by the universities. In the most recent editions there has been a move to a more dedicated effort in social media (eg instagram, facebook, twitter), not only prior but also during the execution of the program.

While the several outreach channels played a crucial role for letting the program be known, at this moment the most important dissemination channel are the students themselves, namely the LIP.IP alumni. By conveying to their colleagues their own experiences, acquired through participation in past editions of the program, they ensure not only the existence of the program but also its operation are shared to potential candidates.

A logo for the program (provided on the first page of this document) has been produced, providing visual identity, used across the various channels and materials. The logo is further printed on items such as pens, carrying bags, paper notebooks, and in the final Diploma, that are offered to students at the end of the program. The outreach component of the program is done in partnership and with the support of the LIP ECO group.

Project proposals

Every LIP researcher is invited and welcome to propose a research project and supervise. Projects are proposed before students are assigned. They should have therefore the flexibility to adapt to the background and degree of involvement of the student(s) that will be assigned. Each project includes a title and a brief description. A list of supervisors with one main responsible contact, along with available dates should be also provided. The desirable background may be also mentioned — although lack of prior experience by students is addressed and mitigated by the common training sessions at the start of the program.

The number of students the project could accommodate should be specified. The suggested number is two. This is for encouraging collaboration while avoiding accumulation of students in single projects and absence in others. However, a project may later receive more candidates from among those that would remain otherwise unassigned.

Student applications

Students apply via an online form accessible from the program's main page on the LIP website. Applicants choose up to 5 projects, ranked in order of preference. Applicants are also asked to provide additional information, such as letter of motivation, cv, familiarity with programming language and tools, university affiliation, and preferred period for project development.

Students enrolled in physics and engineering degrees are eligible. Other candidates are also considered, in case of unfilled vacancies. Students enrolled both on national and internacional universities are equally eligible.

Selection and project assignment

After the registration period ends, each student is assigned to a specific project. The criteria employed are their specified ordered preference, number of students that can be accepted by each project, and if needed supervisor preference. The rationale is foremost that students are assigned to the projects of their preference; and that projects of all research groups get students assigned as feasible.

Firstly, each project specifies the number of students it wishes to receive (vacancies), at project submission time; each student ranks their projects of interest, at the time of student registration; each project provides a ranked order of the students who have selected that project. This information is then used at once to provide assignments of students to projects.

Effectively, the assignment procedure starts by assigning students to the project of their first preference. If the number of students who have selected a given project as first option is larger than available places for that project, the ordered preference of the project

supervisor is used to fill in the project vacancies. For projects that are not filled in the first round of first preferences, students will be assigned taking into account their next preference, and the process is repeated. Practically, the algorithm that has been employed is based on the ranking of the pairs (student, project), according to the formula $8\alpha+\beta/\gamma$, where α (integer from 5 to 1) denotes the student ordering of the project, β (integer from 5 to 1) is the supervisor ordering of the students selecting the project, and γ is the number of projects submitted by the group. The algorithm is scripted down, and automatically executed when due.

The ensemble of candidates is verified, ensuring there are no duplicate registrations, and non eligible candidates (e.g. high school or phd students) are vetoed. The application of the algorithm results in the assignment of student to projects, in what is referred to as the first (automated) stage. It is possible (expected) that a small fraction of projects and students will still remain unassigned. The list of unassigned students, including potentially vetoed ones, is compiled and internally provided to supervisors whose projects still remain with unfilled vacancies, and an effort is made to find matches. Similarly, the list of projects that remain with vacancies at the end of stage-1 is compiled on the program's page. In case a student who has been assigned a project cannot confirm participation, leaving a vacant position in a project, this is added to the list. Such list of projects with unfilled vacancies is shared with the list of students who will have remained without an assigned project at stage-1. Eventually, the list of students who will have remained unassigned will be shared with all supervisors, for consideration in case a project may receive an additional candidate. This second stage of the assignment process is not automated; assignments are made when a matched project-student pair is confirmed. Stage-2 is terminated at the latest up to two weeks prior to the start of the lectures/tutorials week, or until a maximum threshold of students that could be received in the program is reached.

Lectures and tutorials

Each edition of the program starts formally with the in(tro)duction week, welcoming all participants. A full week of lectures and tutorials is offered to all participants, introducing LIP, the field of particle physics, research areas, and tools.

The format and contents of the week is adapted in each edition, but it has contained the following general format:

- **Lectures**, typically held in the mornings, introducing general research sub-fields; these are intended to give an overview of the field, which students are thus expected to attend in general (rather than only the one closest to the research project);

- **Tutorial chats**, following the lectures, consist of thematic discussions, each involving a couple of researchers and a small subset of students, and held locally at each node; individual students choose which discussion they wish to join; unlike the lectures, the discussions are not held in a one-to-many format, but are interactive, and offer an opportunity for students to ask many questions;

- **Hands-on tutorials**, typically held in the afternoons, involve exercises that after being introduced by the facilitators are performed by the students; the tutorials provide an

introduction to data analysis tools, concepts and frameworks; students choose the parallel sessions they wish to follow, depending on their level of familiarity with the tools, the needs of the project and their interest.

In order to ensure a more efficient start of the week of tutorials, a preparatory session is offered in the preceding week:

- **Pre-tutorials**, allow students to test their LIP computing accounts, assist with installation of needed software on own computers, and gain/refresh familiarity with basic programming languages and tools.

Project supervision

Following the introductory week, the students focus on the core part of the program, namely the development of a research project. This is carried out under the guidance and close collaboration of the supervisor(s), who proposed and prepared the project.

Students have normally the opportunity to present their progress and challenges at regular or dedicated meetings within the research groups or lines.

Mid-term activities

Between the introductory week and the final workshop, the students' focus is on developing their individual projects, working primarily with the project supervisors and group collaborators. Nonetheless, a set of activities is organised in order to facilitate the interaction amongst the program participants. This is done in terms of scientific exchange and social gatherings.

Different activities get tried and implemented in each edition. It invariably involves opportunities for the students to exchange with their peers aspects of their work. Participants have the opportunity to introduce themselves and to present, in one form or the other, the themes of their projects, their plans for the upcoming weeks, or share a specific problem or challenge they would be addressing. A competition where presentations are ranked by the fellow participants was successfully implemented in the last edition, and few prizes correspondingly awarded.

Social activities may involve a relaxed barbecue or a gathering, in person or virtual, for coffee or a drink.

These bring the benefit of fomenting the interaction and cooperation amongst students, and with other researchers, and encourage scientific communication, further serving as advance preparation for the final workshop.

Final workshop

Held at the end of the program, the final workshop is a scientific gathering where students present their research work to both fellow students and LIP researchers.

The format adopted has been a presentation per project, gathered in sessions grouping related topics. Each session is chaired by a LIP researcher, who conducts a short discussion following each report. If initially it could fit in a single day, since the second edition the workshop lasts two full days.

The workshop formally marks the end of each edition of the LIP.IP program. Traditionally, the attendance diplomas are distributed amongst the students, along with LIP materials, such as Lab´s annual reports, the most recent newsletter, and few souvenirs from the program and LIP.

Research papers

During the weeks following the final workshop, the students are given the opportunity to submit a research paper presenting and summarising the scientific results achieved during their internship.

The student paper is about 5 pages long, and is presented following a template (provided in latex format, in overleaf). The responsibility for reviewing the paper lies with the supervisor(s) of the associated project. This includes the confirmation that no potentially sensitive materials, e.g. not yet approved by the relevant Collaborations, are included. Each paper is attributed a LIP internal reference,[1] and published on the LIP website. Publication requires formal approval of the main supervisor of the project.

The student paper receives a reference LIP-STUDENTS-yy-xx, with yy denoting the year, and xx reflecting the order of submission of the finalised draft. The papers are hosted in the dedicated database cern.ch/lip/pub, and more recently in https://nc.ncg.ingrid.pt/. The published papers are listed and linked from the Advanced Training section of the LIP site, https://www.lip.pt/?section=training&page=student-publications.

With the adoption of the student papers in the 3rd edition, the program's "book of abstracts", published for prior editions as part of the LIP Bulletin, was discontinued.

Organization

The organisation of the LIP.IP program is ensured by the coordinator, along with a steering team, who ensure the implementation of the components described above that integrate the program. This is done with the support of the various LIP structures, and the participation of the LIP researchers.

[1] This follows the introduction of the LIP referencing of internal scientific documentation, proposed by NL and approved at the LIP Scientific Council (2019).

The internal organisation is facilitated by the internal site of the program (cern.ch/lip/si/, with restricted access), the internal database, and public page of the program (https://www.lip.pt/training/summer-student-program/). The materials shared with students are organised and shared in the program's area in indico, https://indico.lip.pt/category/68/. Communication is aided by mailing lists (steering team estagios@lip.pt, advanced training training@lip.pt, supervisors list estagiosverao.loc@lip.pt, and student lists internprogram.[year]@lip.pt) along with other means, namely the slack system more recently adopted for the program (https://lipinternship-[year].slack.com/). Organization meetings for planning and following up the implementation of each edition of the program are also held each year; including at least one plenary meeting, announced LIP-wide, followed by more focused working meetings.

Timeline

The organisation of the program nominally involves activities from March to November.

Plenary organisation meeting	March
Project submission	March through beginning of April
Program and projects announcement	April
Student applications	End of April to mid-May
Student assignment and selection	End of May
Lectures and Tutorial week	Mid-July
Project development	July-September
Final workshop	Mid-September
Student papers	September-October

Resources

The program is based on resources available at or otherwise made accessible to LIP. Physical resources include office and lab space, meeting rooms and computing labs. These also result in corresponding limitations in terms of number of participants.

The hands-on tutorials were, in initial editions, held in computing rooms, located at associated universities. The necessary materials and needed software were duly prepared in advance and pre-installed in the PCs in the room.

Equally important are the computing and network resources. Nominally, each participant is provided with a computer account in a LIP cluster, centrally managed and supported by the LIP Computing group. Such accounts are used for executing the tutorials during the introductory week, as well as during the project development stage. Existing limitations in

terms of hardware, account preparation and especially support, to a large number of users in short time periods, impose currently the strongest constraints (up to 50 accounts).

In more recent editions, alternatives that could mitigate such restrictions have been explored. These include the preparation of uniform, easy-to-use means for software package installation in the participants' own laptops. And the exploration of online computing resources. Some such alternatives were explored, with success, also precipitated by conditions that were imposed by the pandemic. As a result, a larger number of participants has been accommodated.

Pandemic and online mode of operation

The onset of the pandemic in 2020 brought about significant challenges that imposed adaptions in the organisation of the program. For that year, and despite all uncertainty, there was from the start no hesitation whatsoever in holding the program (several related programs were being put on hold or outright canceled). The baseline structure and timeline was maintained, while nonetheless allowing for an extra dose of flexibility. In 2020 the program was moved to an online mode of operation, while the year after the common activities were kept fully online, with some projects taking place in person.

The level of dedication and participation of both supervisors and students has not decreased at all, indeed the opposite occurred. The successful integration of new means for teaching and collaborating has allowed to even increase the scope and number of participants. With an online mode of operation, some prior limitations in terms of physical resources were mitigated. A record number of applications were received, and a broader and larger set of participants could be accepted. The remote format and tools further facilitated the participation of students in projects offered in different regions, as well as a larger involvement of students and even co-supervisors from abroad.

While the remote mode of operation eased impediments in terms e.g. of physical office/lab space or network bandwidth, the management of such a large number of computing accounts on the cluster became unfeasible. Such was addressed by introducing a so-called pre-tutorial session, focused on computing aspects, and by identifying projects that did not strictly require access to the cluster.

The lectures and tutorials week was moved entirely to a remote format, and project development became for the most part conducted through remote collaboration means, with some taking place in mixed format (in-person and remote), for example, data acquisition at a lab followed by data analysis done remotely. A suite of communication and collaboration online tools was explored and most successfully employed (including Zoom, Slack, Github, Colab, among others).

Also mid-term activities were facilitated, involving both scientific and social get togethers and other activities for participants, now making use of dedicated virtual tools (e.g. GatherTown, Skribbl). Student talk competitions were offered, where students prepare a short exposition of their projects in a creative manner; these were scored by fellow participants for clarity and originality, with prizes awarded to the top few contributions, announced at the final workshop.

In the 2021 edition, a standard large number (over 50) of project proposals were submitted. A record number of student applications (over 120) were received. The effort was made correspondingly to accept a larger number of participants (about 100, i.e. 82%) who were assigned a project. About 86% of the participants successfully completed the program. 70% of the projects further contributed final papers, published on the LIP website.

The onset of an extreme circumstance such as the pandemic effectively served as a stress test taken to the extreme and further corroborates the sustainability of the LIP program.

Cost and stipends

The LIP.IP program is offered free of cost, it does not provide financial assistance, and it is run with a zero-budget.

Financial assistance is provided neither to students nor tutors nor those involved in the organisation. LIP researchers and structures contribute with a fraction of their time and dedication, thus effectively being an integrated part of their work activity. Space and infrastructure are those of LIP.

No student stipends are nominally issued by LIP. Some students however ensure own funding, for example for allowing their stay away from their normal residence location; for example via ERASMUS+ fellowships or other international and national sources.

Students are however provided with work insurance, either by LIP or through extension of their university-based insurance.

Contrats

A contact is celebrated between LIP and each participant in the LIP.IP program. In most cases, the University the student is enrolled in is also part of the contract.

Completion and certificate

A certificate is issued to all participants who complete the program. Successful completion is recognised to participants who carry out the research project and present the outcome at the final workshop or, in alternative, hands-in a student paper.

Credits

The program is hosted by LIP, which not being an academic institution cannot grant directly academic credits to participating students. In some cases, students further pursue their projects in the framework of university courses. In several involved universities, participation in the internship program is recognised, and may appear in the student record as extracurricular activity.

Some students from foreign institutions who carry out their internship integrated in the LIP.IP program obtain full academic credits back on their home institutions.

The aim to allow academic credits to students participating in the LIP program by their universities has been pursued, including in the context of course reorganisations. Some options are available, which are specific to each university.

Steering

The organisation of the program is overseen by the coordinator, with the implementation of core program activities guided by a steering team.

In the first editions of the program, the coordinator provided a considerable level of micromanaging, for facilitating a more efficient establishment of an initial baseline structure. The deliberations were based on wide consultation and plenary discussion, i.e. involving all project supervisors and contacts from the relevant LIP structures.

In later editions, with an established baseline structure in place, the organisation became increasingly based on a distributed rotating coordination model. The organization of each core activity is assigned in each edition to a colleague who has taken part in previous editions of the program (namely as supervisor). The effort is made to have a representative and diverse team in each edition (e.g. in what regards region, research line, gender, etc) and, importantly, to have rotation at each edition. The steering team includes representatives from each pole and from the most directly involved structures.

The adopted rotating distributed organization model facilitates the involvement of various colleagues also in the organization of the program and foments the continued implementation of innovative ideas and improvements in each edition. It ensures the broader participation of colleagues from different regions and research lines, and offers opportunities to LIP researchers to acquire coordination experience. It further renders the program more sustainable in the long term, also from the coordination perspective.

	1st edition	**2nd edition**	**3rd edition**	**4th edition**	**5th edition**
year	2017	2018	2019	2020	2021
Coordinator	**J. Varela**	**N. Leonardo**	**N. Leonardo**	**N. Leonardo**	**N. Leonardo**
Outreach	C. E.Santo	N.Leonardo	L. Apolinário	S. Andringa	C. E.Santo
Lectures and tutorials week	J. Varela	N. Leonardo	N. Leonardo	R. Gonçalo	A. Lindote
Mid-term	-	N. Leonardo	N. Leonardo	-	R. Sarmento
Workshop	N. Leonardo	N. Leonardo	N. Leonardo	L. Apolinário	G. Eichmann
Papers	-	-	N. Leonardo	N. Leonardo	S. Andringa

activity	*team*
Outreach	N. Leonardo, S. Andringa, C. E.Santo, V. Lozza, L. Apolinário, H. Santos, R. Conceição, R. Gonçalo, D. Galaviz, C. Quintans, P. Muino, N. Barros
Lectures	M.Pimenta, J.Varela, C.Quintans, A.Gomes, A.Blanco, M.Gallinaro, P.Assis, R.Conceição, L.Apolinário, P.Gonçalves, P.Bargassa, S.Andringa, P.C.Muino, R.Gonçalo, H.Santos, B.Tomé, N.Castro, M.Quaresma, E.L.-Aznar, P.Crespo, A.Peixoto, L.Perfeito, C.E.Santo, P.Braz, M.Romão
Discussion chats	N.Leonardo, F.Veloso, N.castro, P.Bargassa, J.G.Saraiva, J.Sampaio, T.Niknejad, A.Blanco, H.Carvalho, R.Sarmento, B.Tomé, F.Riehn, L.Cazon, N.Barros, V.Lozza, A.Lindote, E.L.-Asamar, C.Franco
Tutorials	N.Leonardo, H.Santos, A.L.Carvalho, P.Muino, R.Gonçalo, A.Pina, J.G.Saraiva, R.Pereira, A.Costa, R.Sarmento, G.Strong, A.S.Nunes, E.Melo, D.bastos, M.Araújo, B.Lopes, J.A.Gonçalves, L.Sintra, J.Silva, R.Pedro, M.Barros, L.Coelho, R.Barrué, A.Boletti, M.Romão, T.Vale, G.Pereira, A.S.Inácio, N.Barros, V.Lozza, C.Neiva
Mid terms	N.Leonardo, G.Strong, P.Assis, R.Sarmento, A.S.Inácio, G.Pereira
Session chairing	N.Leonardo, L.Apolinário, S.Andringa, C.Quintans, V.Lozza, J.Seixas, R.Sarmento, R.Gonçalo, A.Peixoto, A.Lindote, D.Galaviz, H.Santos, T.Niknejad, P.C.Muino, N.Barros, J.G.Saraiva, M.Quaresma, R.Conceição, P.Assis, G.Eichmann, I.Ochoa, M.Pinto, B.Tomé

	contacts	*team*
ECO	C. E.Santo	N. Leonardo, S. Andringa, S. Ribeiro, A. Inácio, M. Pisano
Computing	H. Gomes	C. Manuel
Secretariat	N. Antunes	O. Janeiro, J.P. Santos
Coimbra	F. Veloso	
Minho	R. Sarmento	

Statistics

edition / year	# of projects proposed	# of student applications received	# of students selected (presented)	# of final project presentations	# of student project papers
1st — 2017	34	30	29	16	-
2nd — 2018	40	95	63	33	-
3rd — 2019	38	78	68/55	30	8
4th — 2020	39	67	67/55	33	22
5th — 2021	54	122	98/84	50	36

In conclusion

The LIP.IP program is a fully established, essential LIP-wide Advanced Training activity.

The program has been extremely successful in attracting university students to LIP. And in introducing them to scientific research through hands-on participation in research projects. Students become part of state-of-the-art research carried out LIP wide, working alongside researchers who impart the excitement of doing research in fundamental particle physics or advancing associated technologies in frontier experiments and in the context of international collaborations.

A fraction of the enrolled students systematically remains engaged in further research at LIP. This is reflected in the number of students who carry out university projects and pursue their theses research with the LIP groups — which has markedly increased in recent years. The program facilitates to participants a skill set, both at the technical level as well as in terms of collaboration and communication, beneficial for their academic and professional careers, complementing university training.

The program is highly attractive, with high levels of student applications and enrolment and of participation of LIP researchers across all research areas, groups and regions. It has benefitted from the ability to systematically and continuously innovate at each edition. The program, through the organisation that has been established, has demonstrated to be fully sustainable. This, even against otherwise disruptive changes — such as the constraints imposed by a pandemic — which have resulted in the incorporation of further innovation.

The LIP.IP program has now become a recognised flagship of the Laboratory.

Comments on report

Suggestions or corrections to this report may be sent to nuno.leonardo@cern.ch.

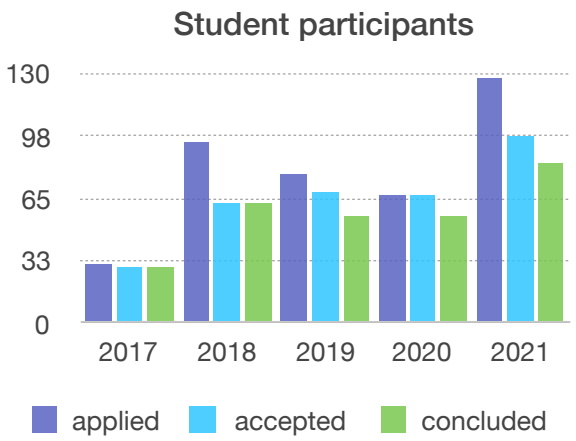
Requests regarding the internship program itself may be sent to training@lip.pt.

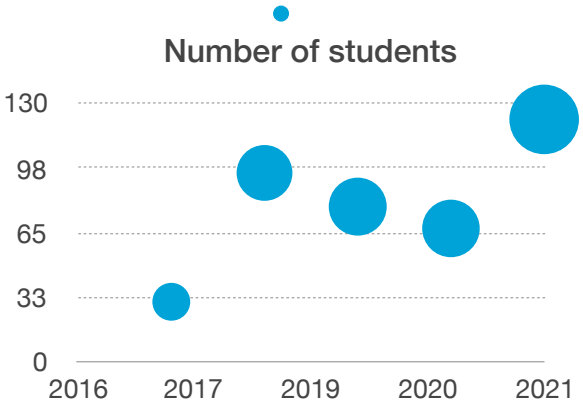
Original version submitted to LIP directorate on February 18th, 2022.

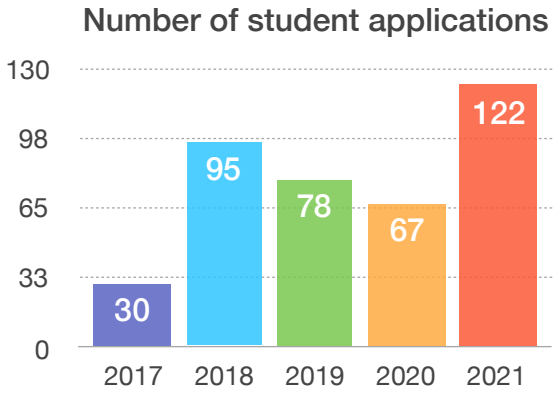
Complete version with appendix shared with all LIP users on April 29th, 2022.

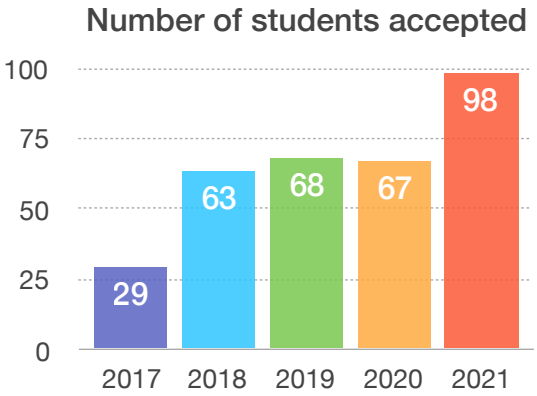
Appendix

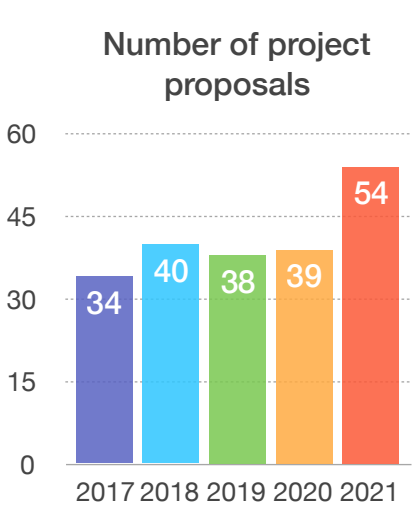
Student statistics

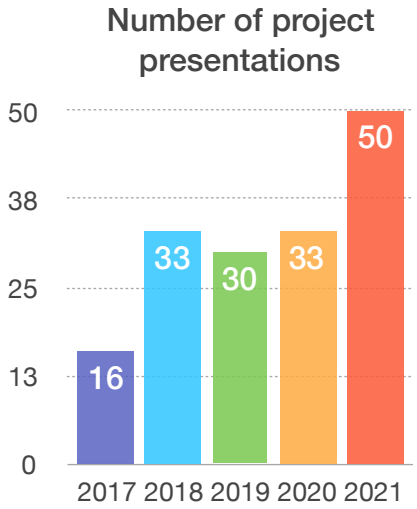


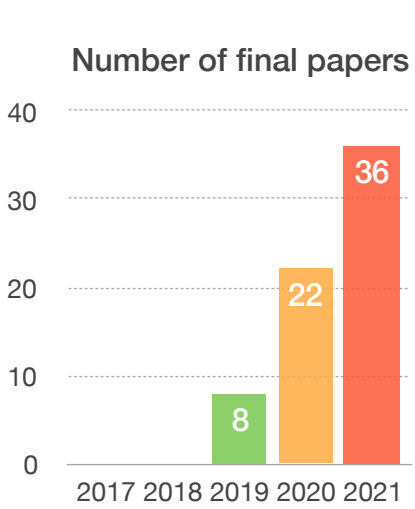






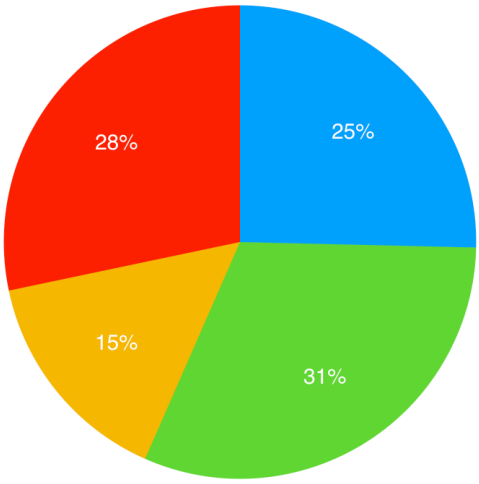




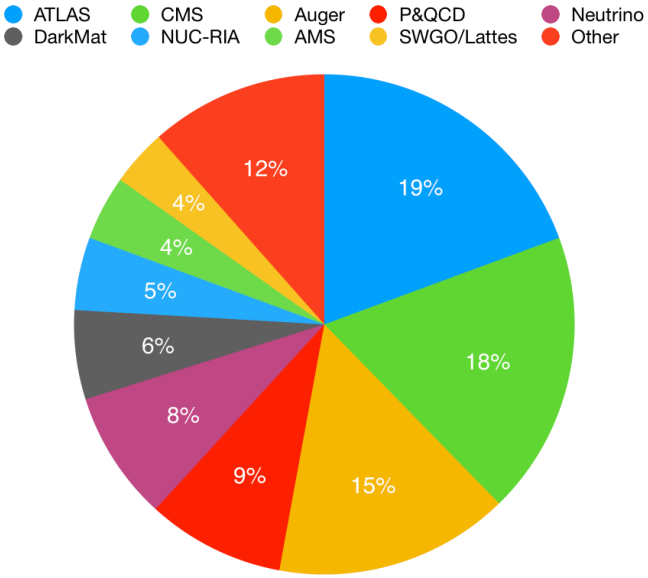


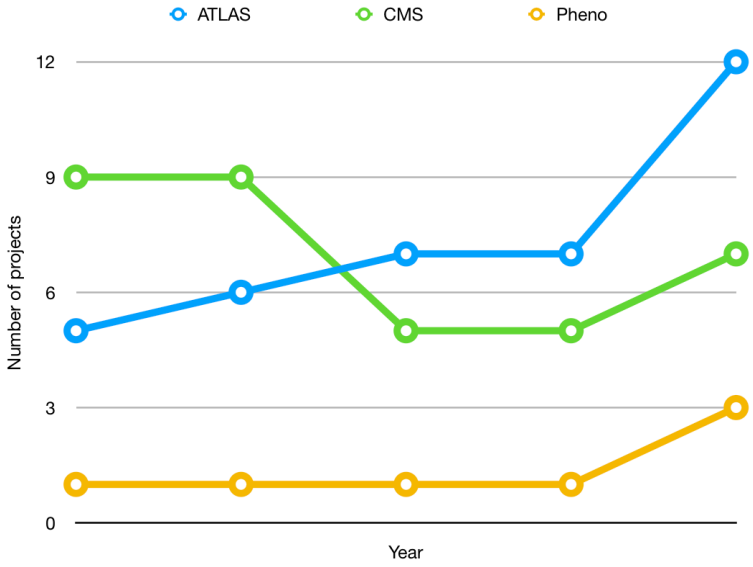
Project statistics — Number of submitted projects per research area

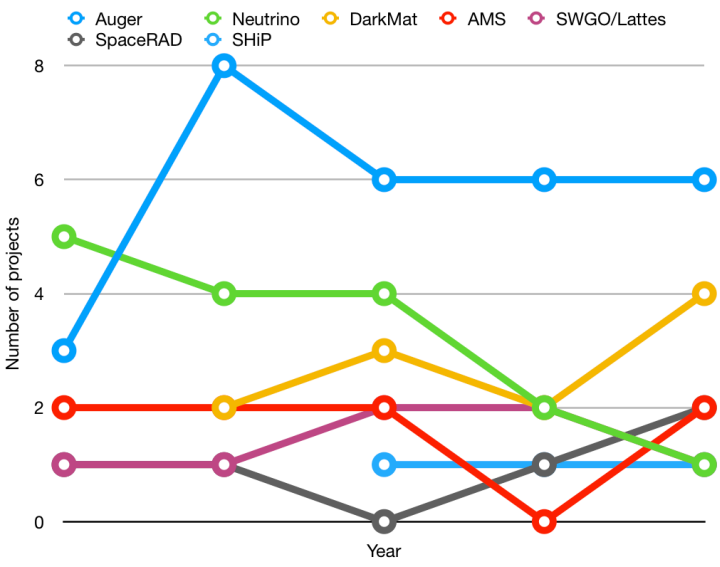
Year	2017	2018	2019	2020	2021
Group	**Physics at the LHC**				
ATLAS	4	3	2	3	7
CMS	7	7	3	4	5
Pheno	1	1	1	1	3
	Cosmic Rays, Neutrinos, Dark Matter				
AMS	1	1	2		1
Auger	2	6	3	5	5
DarkMat		1	2	2	4
Neutrino	4	3	4	2	1
SHiP			1	1	1
SpaceRAD	1	1		1	2
SWGO/Lattes	1	1	2	2	1
	Structure of Matter and Heavy Ions				
ATLAS HI		1	1	1	1
CMS HI	1	1	1	1	1
NPStrong				1	2
NUC-RIA		1	2		1
P&QCD	6	1	2	4	2
	Detectors and Instrumentation				
AMS (det)	1	1			1
Auger (det)	1	1			
CCMC				1	2
DarkMat (det)		1	1		
DetLab				1	1
Dosimetry		1	1	1	2
LOMaC, ATLAS	1	2	4	3	4
MuTom		1	3	1	1
nDet					1
Neutrino (det)	1	1			
NUC-RIA (det)		2	2		1
P&QCD (det)	1	1			
RPC, HADES				1	1
SimBigDat				3	2
TagusLIP, CMS	1	1	1		1

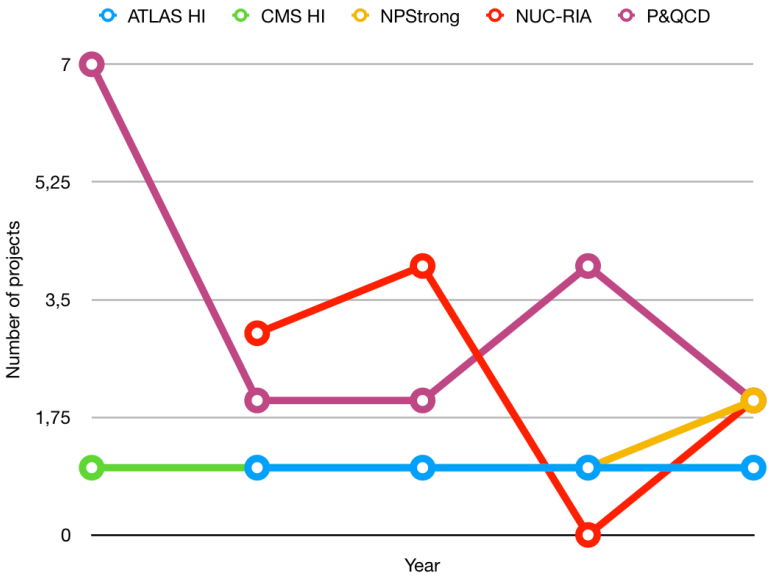


- LHC physics
- Cosmic Rays, Neutrinos, Dark Matter
- Structure of Matter and Heavy Ions
- Detectors & Instrumentation



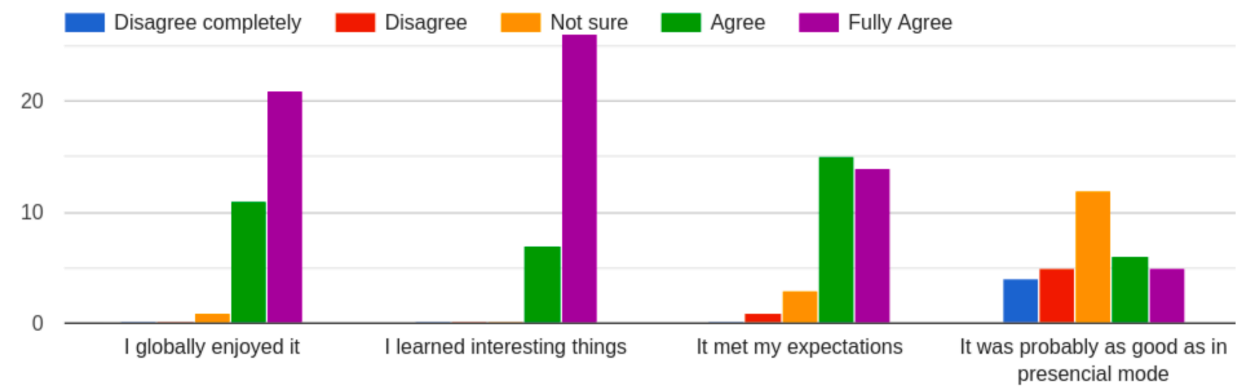




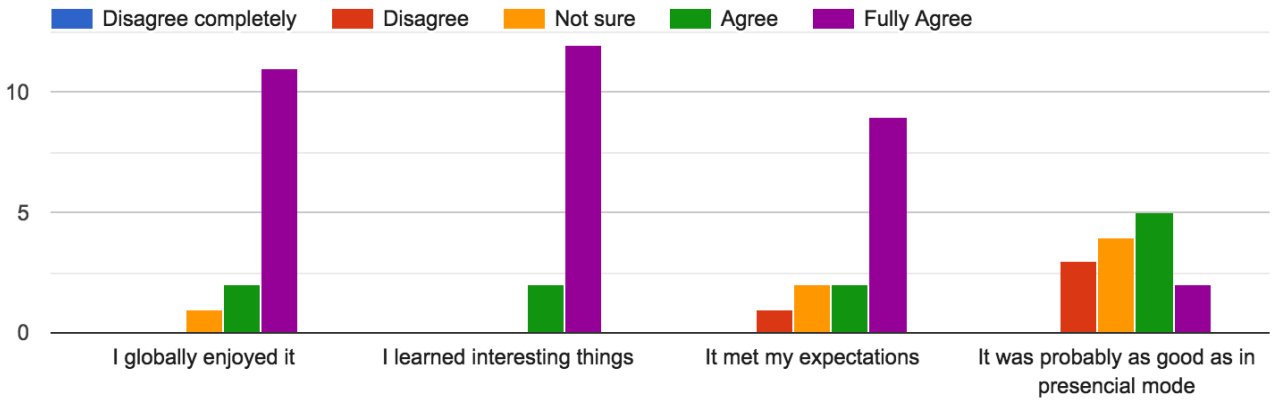


Student feedback — general assessment

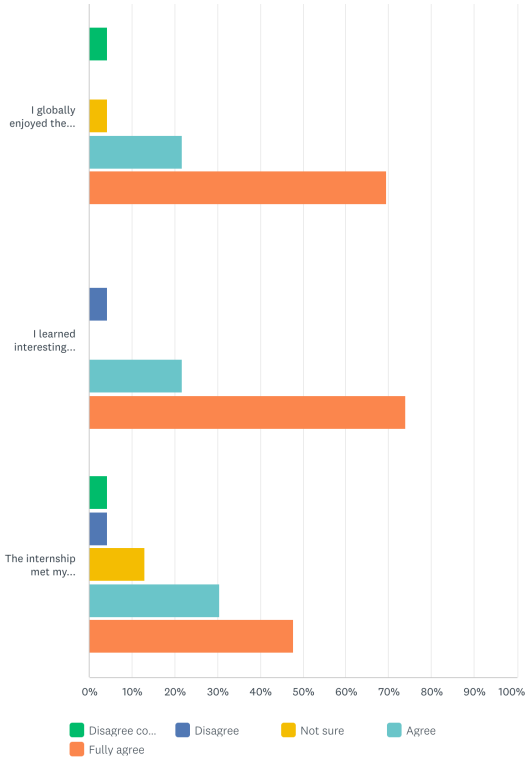
2021 (33 replies):



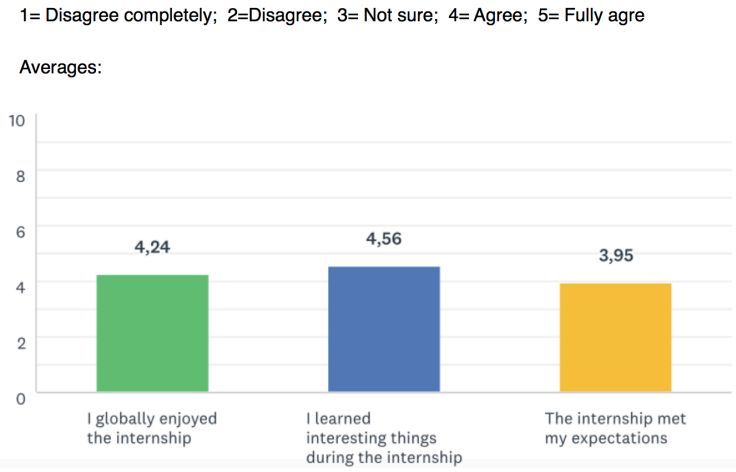
2020 (14 replies):



2019 (23 replies):



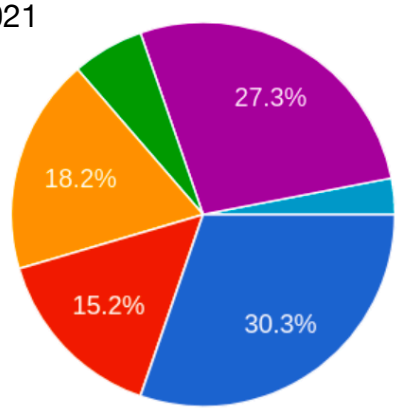
2018 (41 replies):



Student feedback — perspectives after internship

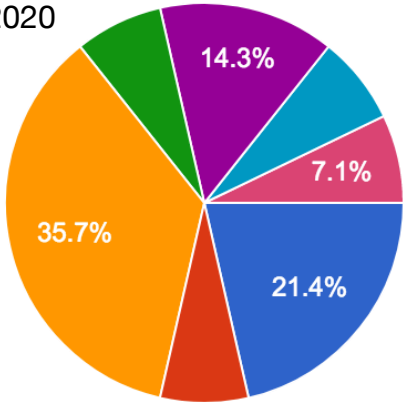
Please select the option that better describes the future of your research project

2021



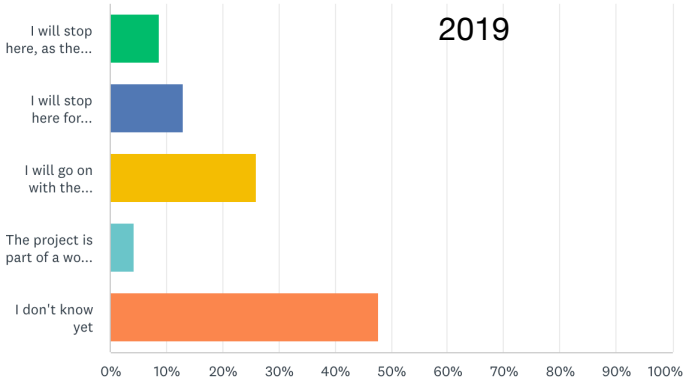
1 I will stop here, as the internship is over
4 I will stop here for practical reasons, but I would rather continue
3 I will go on with the project
The project is part of a work that I started before the internship and will continue
2 I don't know yet
I am eager to continue, but remote work have some difficulties in my country. I…

2020

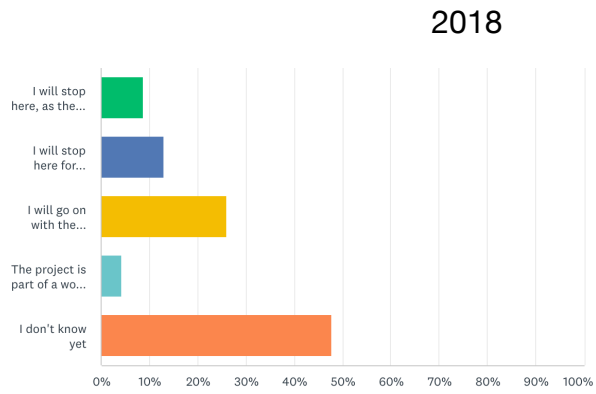


I will stop here, as the internship is over
I will stop here for practical reasons, but I would rather continue
I will go on with the project
The project is part of a work that I started before the internship and will continue
I don't know yet
Stop this project, start a different one
I will go on, but on a different project

2019

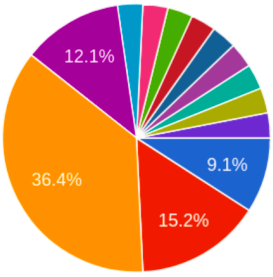


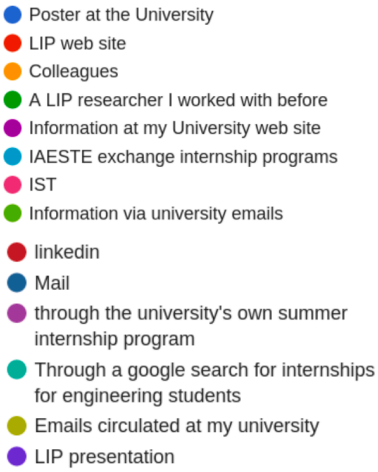
2018



Student feedback — program outreach

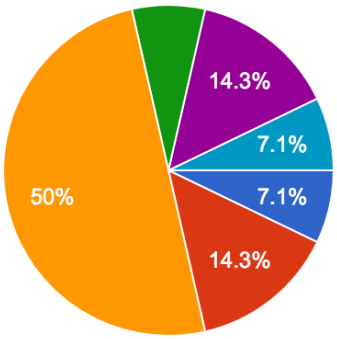
How did your first hear about the program?

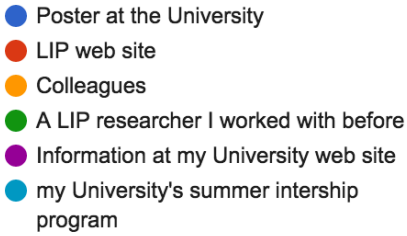


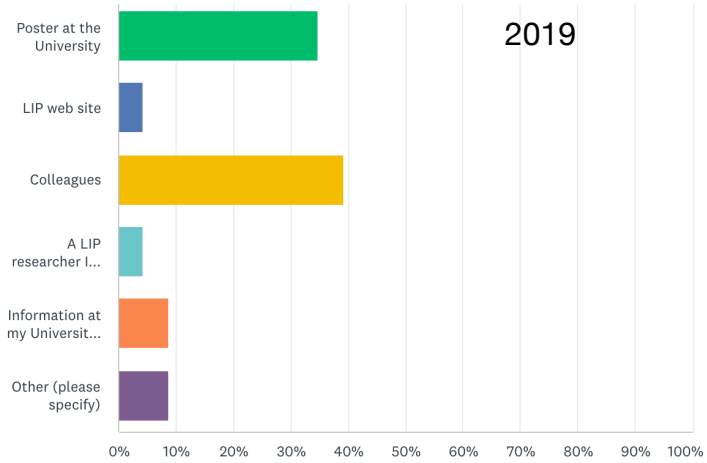


2021

2020

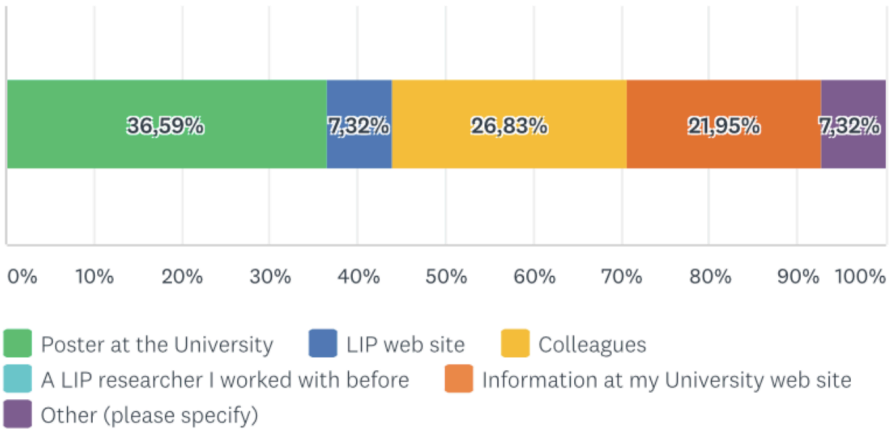






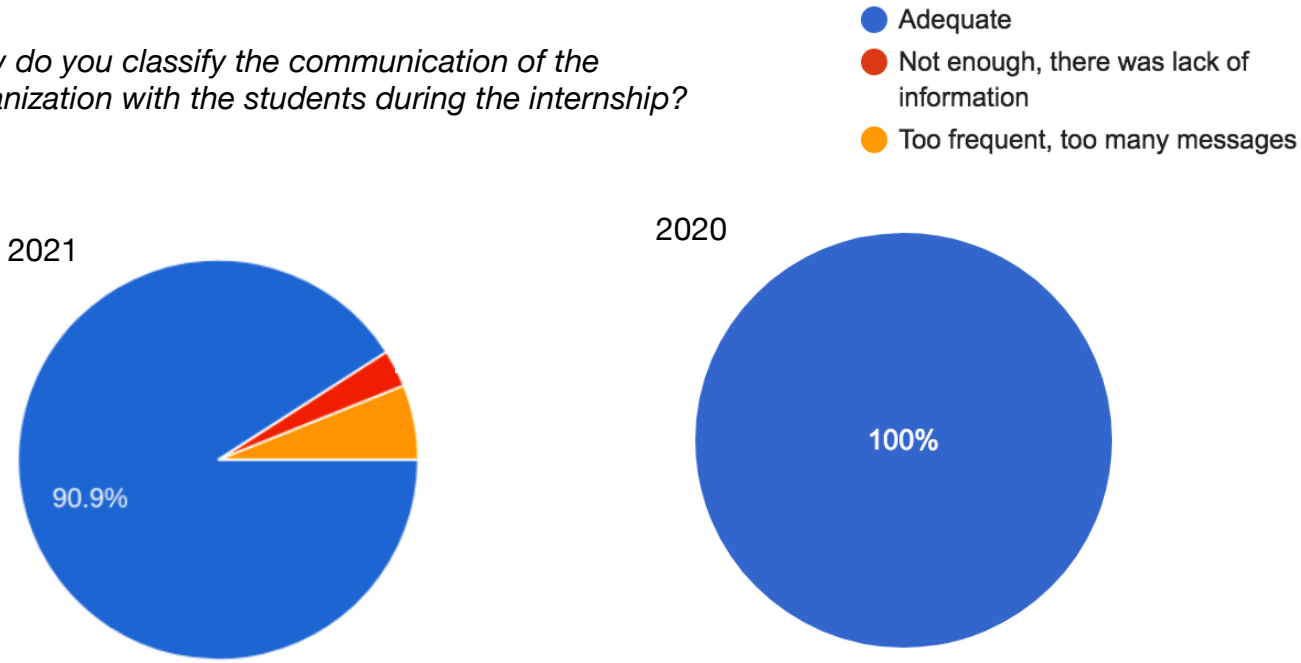
2019

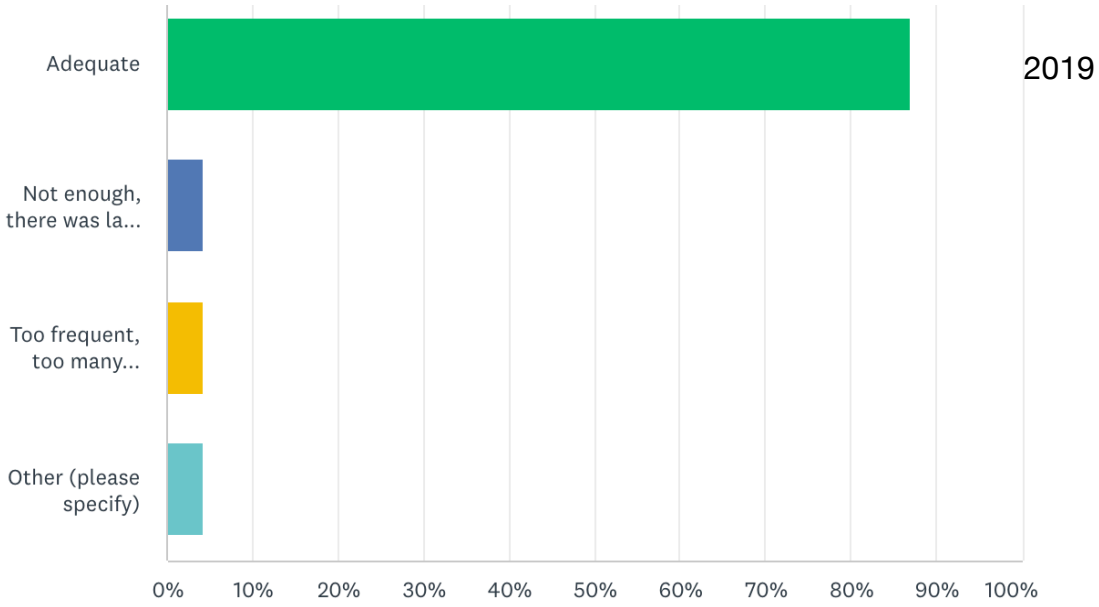
2018

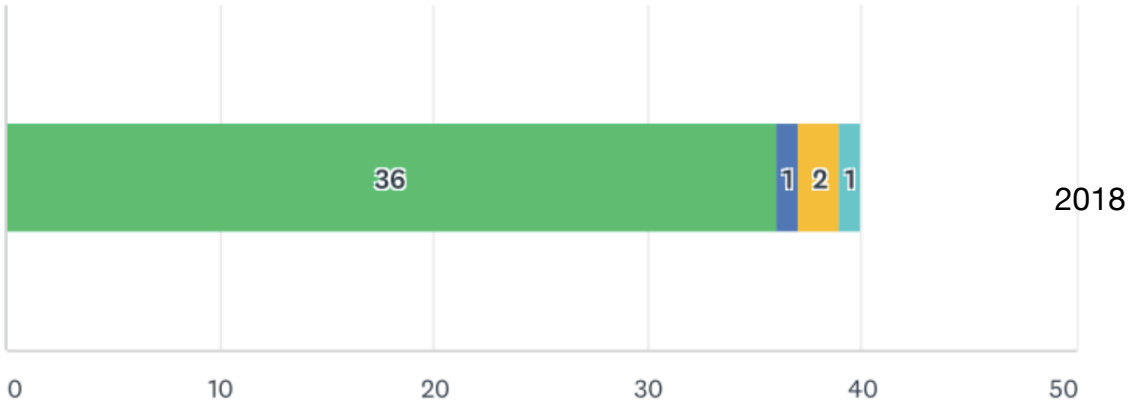


Student feedback — program communication

How do you classify the communication of the organization with the students during the internship?



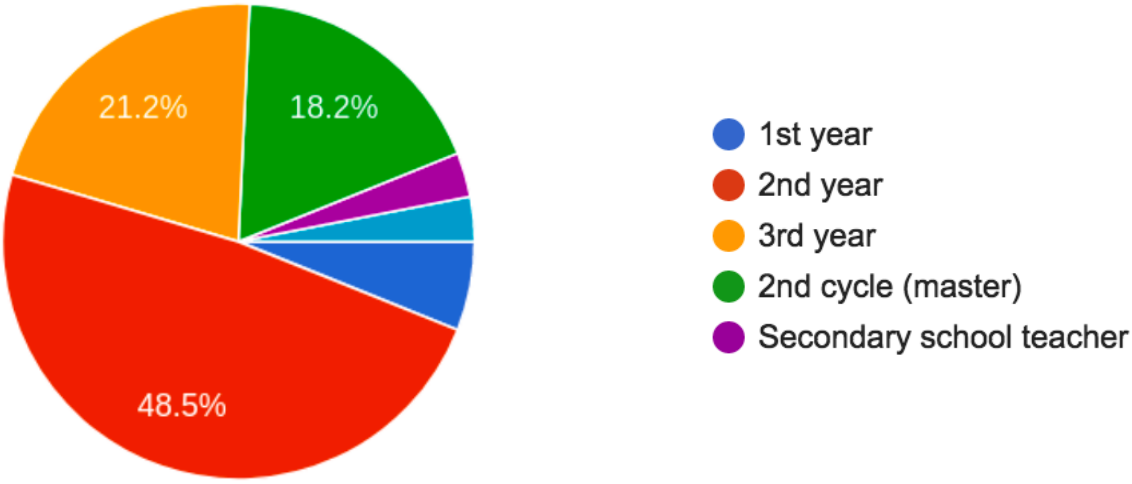




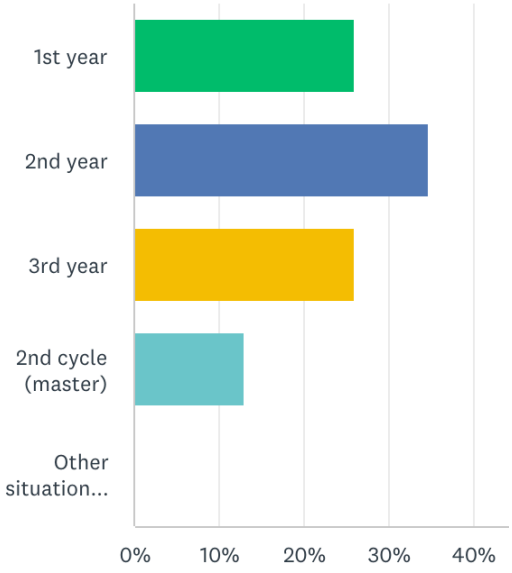
Student feedback — university year

In which year of University were you enrolled during the last academic year

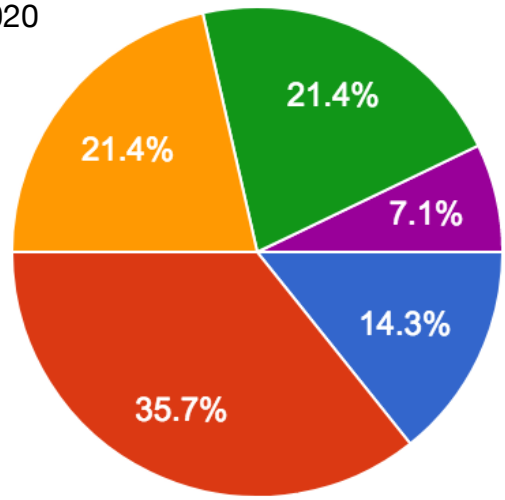
2021

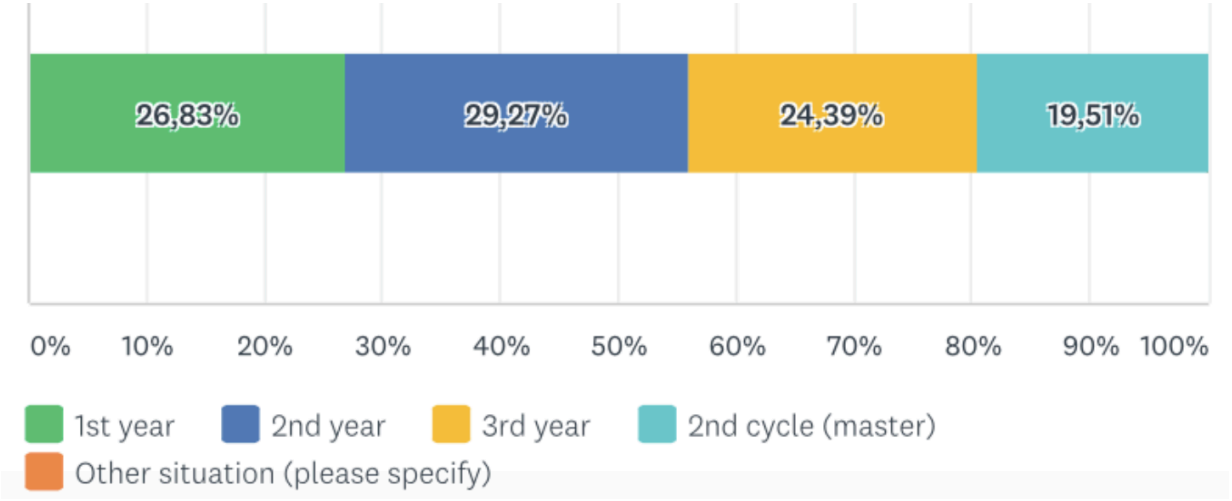


2019



2020





LIP student enrolment — Internships vs MSc and PhD theses started