EVALUATION OF PHYSICS AT THE HEBREW UNIVERSITY

COMMITTEE FOR THE EVALUATION OF PHYSICS DEPARTMENTS IN ISRAEL

AUGUST 2019

Section 1: Background and Procedures

1.1 In the academic year 2018-19 the Council for Higher Education [CHE] put in place arrangements for the evaluation of study programs in the field of Physics in Israel.

1.2 The Higher Education Institutions [HEIs] participating in the evaluation process were:

- Ariel University
- Bar-Ilan University
- Ben-Gurion University
- The Hebrew University
- Lev Academic Institute
- The Open University
- Technion – Israel Institute of Technology
- Tel Aviv University
- Weizmann Institute of Science

1.3 To undertake the evaluation, the Vice Chair of the CHE appointed a Committee consisting of[1]:

• Prof. Steven Kahn: Committee Chair	Stanford University, USA
• Prof. Laura Greene	National MagLab and Florida State University, USA
• Prof. Herbert Levine	Northeastern University, USA
• Prof. Michal Lipson	Columbia University, USA
• Prof. Yael Shadmi	Technion, Israel

Ms. Maria Levinson-Or served as the Coordinator of the Committee on behalf of the CHE.

1.4 The evaluation process was conducted in accordance with the CHE's Guidelines for Self-Evaluation (February 2018). Within this framework the evaluation committee was required to:

- examine the self-evaluation reports submitted by the institutions that provide study programs in Physics
- conduct on-site visits at those institutions participating in the evaluation process
- submit to the CHE an individual report on each of the academic units and study programs participating in the evaluation
- set out the committee's findings and recommendations for each study program
- submit to the CHE a general report regarding the evaluated field of study within the Israeli system of higher education

[1] The committee's letter of appointment is attached as **Appendix 1**.

1.5 The evaluation committee examined only the evidence provided by each participating institution — considering this alongside the distinctive mission set out by each institution in terms of its own aims and objectives. This material was further elaborated and explained in discussions with senior management, faculty members, students and alumni during the course of each one-day visit to each of the institutions.[2]

1.6 This report deals with the Racah Institute of Physics at the **Hebrew University**. The Committee's visit to Tel Aviv University took place on June 5th, 2019. The schedule of the visit is attached as **Appendix 2**.

1.7 The Committee would like to thank the management of the Hebrew University and the Racah Institute of Physics for their self-evaluation report and for their hospitality towards the Committee during its visit to the institution.

Section 2: Executive Summary

The Hebrew University is continuing to exhibit the high level of Physics research and training expected at one of Israel's highest ranked universities. We were particularly impressed by the agility of the Racah Institute (RI) in maintaining excellent efforts in traditional areas of strength, such as astrophysics, even while expanding to newly emerging topics like quantum science and neural information processing. One should note that upcoming retirements will affect some of this balance, and they need to be taken into account during planning. Overall, there are no essential changes needed in this program.

We were concerned about several aspects of infrastructure. There are clear challenges associated with the geographical spread of RI across the campus, and this may be exacerbated due to displacements necessitated by light-rail construction. One should not wait for problems to emerge before creating a mitigation strategy. There is also some improvement needed in the teaching labs. Finally, there is a clear need to create a more coherent approach to graduate student funding, and the university should facilitate this improvement by making available direct fellowship funds for advanced degree programs.

[2] Prof. Yael Shadmi did not participate in the visits to the Technion and to Ariel University or in the panel's discussions concerning the evaluation of these institutions; Prof. Herbert Levine did not participate in the visit to Bar-Ilan or in the panel's discussions concerning the evaluation of this institution; Prof. Michal Lipson did not participate in the visits to Weizmann Institute of Science, Bar-Ilan University, Jerusalem College of Technology, Ariel University and Ben-Gurion University.

Section 3: Observations

3.1 Introduction

The Hebrew University of Jerusalem is among the oldest in Israel, and it is arguably the nation's most distinguished complete university. It has an equally proud history in physics, where the university's Racah Institute of Physics, named after Giulio Racah, a leader in the early development of atomic spectroscopy, has maintained a worldclass research effort across a range of fields for many years. The RI can boast of a number of outstanding alumni, who have played pioneering roles in the early development of many subdisciplines, both within Israel and outside.

Below, we comment on our impressions of the research and teaching components of the RI, based on the self-evaluation report, and our in-person visit:

3.2 Organizational Structure

The RI is a single department located in the faculty of science. At present the dean of the faculty is from physics as well. There is also a small Applied Physics Department, which was formerly at the Engineering School but was recently moved to the same science faculty. We were not informed of any overlap between the RI and Applied Physics, nor of the rationale for the separation between these two departments. There are separate informal groups inside the RI arranged according to rough scientific subdisciplines, but those groups have no administrative role in the management of the Institute.

3.3 The Self-Evaluation and QA

The Hebrew University has developed an internal quality assessment office, which is part of the Rector's Office and headed by a full professor. This office initiates international reviews of the academic units, and it assists the units in preparing the self-evaluation reports. Once a review is received, the relevant unit is asked to respond to it. The report and the response are then discussed at the University's Academic Policy Committee, which consists of the President, the Rector and Vice Rectors, as well as faculty members and independent, non-faculty members. The head of the Office of Assessment & Evaluation leads the discussion, which includes presentation and Q&A with the heads of the relevant academic unit. The discussion is concluded with a set of recommendations for implementation. The head of the Office of Assessment & Evaluation is then responsible to work in cooperation with the academic unit on implementing the recommendations, including required changes in policies of the school/faculty or the university in general. However, to our knowledge there was no such evaluation process conducted in recent years for the RI.

Most of the self-evaluation report (SER) submitted to the CHE was written by the Head of the Institute, with some input from the rest of the faculty. The SER shows that the RI took the process seriously and engaged thoughtfully with the self-evaluation.

3.4 Undergraduate Education

Overall, the department offers a solid undergraduate program, with about half the students taking dual tracks. Introductory courses are taught in large groups, with around 100-130 students per lecture. Sections are relatively large, with 30-40 students in each group. This is due to the limited amount of funding available for TAs, which is a historical problem at the RI, but has been improving with recent administrations.

Teaching is traditional frontal lecture teaching. The quality of the lectures is generally high, though in some cases the students felt the classes were disorganized. The use of online tools seems to be inadequate, and lecture materials are not always available online in a timely fashion. Lectures are now routinely videotaped, but the quality is poor, and course Moodle sites are slow.

A ``help center'', staffed by TAs, was recently created, and is available for students every day. Its effectiveness, though, is not entirely clear.

The program seems to be quite challenging, with about a third of the students leaving after the first year. This is likely due to the RI strategy of being relatively liberal with admission criteria, while maintaining high standards for course performance.

The RI recently initiated a mentorship program, with each faculty member mentoring a few undergraduate students on issues related to the study program, and undergraduate research. So far, however, only about a quarter of the students make use of the program. Still, most faculty members are very approachable, and are happy to provide advice and answer questions.

The third-year lab is in need of renovation. Some of the experiments are really old.

Students are encouraged to engage in research, in particular through an elective lab course which replaces one semester of the 3rd year lab. Indeed, around half the students get some research experience during their undergraduate studies.

3.5 Graduate Education

The graduate education program at the RI is similar to that of the other major research universities in Israel and their counterparts in the United States. There is an MSc program, which is nominally 2 years, consisting of coursework and a thesis, and a PhD program, nominally 4 years, involving a more extensive devotion to research. As at other universities, there is also a direct PhD track, where a student can proceed directly to the PhD without writing a master's thesis, receiving an MSc along the way. However, this Department does not especially encourage the direct PhD option, arguing that in order to be accepted into that program, a student would have had to have demonstrated an ability in research at some level, typically through an early publication. If such a publication exists, turning it into an MSc thesis is not a significant additional burden.

The required courses for the MSc and PhD degrees are Advanced Quantum Mechanics and Advanced Statistical Mechanics. Students consider these to be challenging courses, quite a bit more so than their undergraduate courses, but do not object to the requirement. The Department also offers an array of elective courses in the various physics subfields.

Many students find it difficult to complete the MSc degree within the nominal 2 years. This appears to depend strongly on the interaction with the advisor, and whether or not the advisor chooses a research problem which can be reasonably addressed in the short amount of time available. Some students have taken 4-5 years to complete the MSc degree. The RI is somewhat more rigorous in enforcing the term limits in the PhD program, although it is not unusual for a student to take at least one additional year there as well.

In general, only the MSc or PhD advisor is aware of the student's progress from year to year. No other faculty member gets involved until the final thesis defense. This pattern is similar at other Israeli universities and has a number of drawbacks. We comment on this in the committee's general report.

RI PhD students receive excellent training, judging from their success after graduation. The evidence for this is anecdotal, but we did not hear of any cases of students who were strongly dissatisfied with their time spent in graduate school at the university.

The RI has been making attempts to standardize the financial support for graduate students at HUJI, and they assert that they are now competitive with the support offered elsewhere in Israel. However, this support consists entirely of funding from research grants and through TA-ships. There are no university-level funds dedicated to grad student support. That is an unfortunate circumstance that has a number of implications: First, there may be instabilities

in funding due to fluctuations in a research-advisor's success at getting proposals accepted. Second, students are not free to work with advisors who do not have research grants. We strongly suggest that the university find a means to identify some funding to cover graduate stipends in such situations.

Graduate students are generally happy at the RI, complementing the faculty on their openness and the overall culture of the Institute. However, when there are problems, especially with the individual advisors, students are unaware of how or where to seek help. The Institute does not appear to have any form of ombuds process. Students often turned to the Institute's secretaries for advice.

3.6 Faculty and Human Resources

The hiring of new faculty is handled through a screening committee that looks at a variety of candidates from an Institute-level perspective. As at other universities in Israel, the basic paradigm is to look primarily at Israelis returning from a postdoc abroad. However, RI has occasionally demonstrated more flexibility, for example in the recent international recruitment of John Howell and two other non-Israelis. Indeed, even in cases where they have hired Israelis, our impression is that RI has been more agile than most in strategically targeting newly emerging fields, such as quantum information, and the physics of neural systems/deep learning. Their agility seems to be facilitated by the existence of the appointments committee, since it appears to take a more centralized approach to hiring over a broad range of fields. The creation of scientifically-based centers or clusters at RI may have also played an important role, since these appear to be well-poised to adapt and provide resources for hires in new fields.

In general, Ri seems to be less biased towards its own graduates, which is good since it reduces inbreeding and enables new strategic directions. As is typical of the other Israeli universities, the tenure rate is quite high, so the initial hiring phase is especially crucial for ensuring that the quality of the faculty in research and teaching is maintained or enhanced.

We did not hear of any particular attention to postdocs. Some groups have them, but others (perhaps even a majority) do not. The experimentalists are provided with the standard level of technical support (50% technician for each lab), and unlike what we have heard at other places, this level of support, and the recruitment/retention of proper personnel for such lab positions, seems to be manageable, and not in crisis. It is likely that the resources provided by the new scientific centers are helping to make this work.

3.7 Research

Biophysics and Non-Linear Physics

As in many other leading physics departments worldwide, the RI has recognized the increasing interest and excitement in the application of physics ideas and techniques to the study of living systems. The Institute is taking an admirably broad view of the possibilities in this area, and it is well positioned to be able to compete with other Israeli institutions for hiring the best candidates, but there is still work to be done.

The current biophysics effort at the RI is made up of several parts that seem rather decoupled. On the one hand there is the theoretical effort (Sompolinski, Burqk and partially Ringel), which is mostly devoted to information processing in neural systems, is coupled strongly to a relatively new interdisciplinary university center devoted to brain science, and is located in a different part of the campus. This effort, while clearly excellent (as has been recognized by international prizes), does not appear to have much overlap or much interaction with the mostly experimental research focused on the cellular scale located proximally to other physics groups. That experimental group (Balaban, Sherman, Vaknin) is quite well-known in its own right, for example for the work on phenotypic variability in the response to antibiotics. There is also a group of individuals (Solomon, Assaf, partially Feigel) working on statistical physics with some application to living systems. Taken all together, there is an incredibly vibrant, if somewhat uncoordinated, effort on biophysics at the RI.

A separate very highly regarded group focuses on non-equilibrium, nonlinear processes such as turbulence, fracture and defect dynamics. This is one of the leading groups in Israel in this subfield. Feinberg has been a world-wide leader in fracture mechanics and the origin of friction, while Sharon has contributed new ideas to the effects of growth on morphology (for both living and non-living systems. This effort is supported by theory (Meerson and Katzav) as well some of the researchers formally considered biophysicists, as mentioned above. The recent addition of Moshe makes this group even stronger. Again, there is an admirably broad view of how physics can impact our understanding of a wide range of natural processes.

One potential concern is the apparent gap between the biophysics effort at the RI, and the soft condensed matter and nonlinear statistical physics efforts. It is generally recognized that many problems arising in biological systems require nonlinear statistical physics-based analyses, and that this field often forms a natural bridge between biophysics and soft condensed matter physics. In fact, several faculty members who are nominally listed in the soft CM group, do have

specific biological interests and projects. Yet viewed from the outside there seems to be a gap. Perhaps, one or more of the senior faculty could consider working toward fostering a more cohesive all-around effort.

AMO

Research related to AMO within the RI is extremely strong. The associated faculty (Bar-Gill, Katz, Howell, Rapaport , and Eisenberg) are involved in topics that are of very high interest to the broader community, such as quantum optics experiments on the border between quantum and classical phenomena, squeezed states, excitonic- polarities, and the deterministic generation of pure single photon states. Their research is published in highly respected journals, and it is heavily cited. The faculty have ties and connections with top researchers around the world. Much of the research leverages the nanofabrication center and the quantum center - both excellent shared facilities. However, the group's cohesiveness and degree of interaction suffers from the fact that 5 out of the 7 AMO faculty are in 5 different buildings on campus.

Astrophysics and Relativity

The astrophysics and relativity group at the RI is among the most distinguished in Israel, and it has produced a significant fraction of the Israeli PhD's in this field who have gone on to faculty positions, both within Israel and abroad. The current group consists of Piran, Dekel, Sari, Shaviv, Horesh, and Stone. Horesh was recently hired, and Stone will start next year. The research topics covered: high energy astrophysics, relativity, cosmology and galaxy formation, stellar structure, and planetary physics, address some of the most pressing issues in the field. Horesh is the first observer. Prior to his hiring the research program at the RI had been entirely theoretical. He is specializing in radio astronomy, which is a new field for Israel generally.

The demographics of the group create an issue of concern. Both Piran and Dekel, who have been enormously productive, are nearing retirement. In addition, the very distinguished relativist Jacob Bekenstein passed away unfortunately, just prior to retirement. Both Sari and Shaviv have taken administrative positions at the university, which have decreased the time they have available for research. Thus, although this group is arguably the most successful in the RI in terms of publications and citations, it may soon be subcritical. Further hiring in this field is essential.

As is the case elsewhere in Israel, observational opportunities for Israeli astrophysicists are limited, due to the absence of major observatories in the country. There has been a proposal for Israel to join the European Southern Observatory, which has been under consideration for years, and which would go

a long way toward rectifying this problem. We comment on that proposal in the general section of this report. Despite the fact that most of the astrophysicists at the RI are theorists, they are strongly supportive of that proposal.

High Energy Physics

High energy research at the RI was purely formal prior to 2017, when a particle theory group was created with the hiring of Hochberg and Kuflik. The group is planning on expanding into experimental HEP as well.

The formal group has had a strong presence in String Theory research, which is continued mainly by Giveon, with key contributions in black holes, brane- and QFT-dynamics. The group research has diversified in recent years, with Kol working on the interface of gravity and string theory, and alternative tools for the computation of Feynman diagrams. Smolkin, hired in 2016, brings expertise on entanglement entropy in QFT, and on quantum information and GR.

The new particle physics effort has dark matter (DM) as its central focus, with the new hires coming with highly visible contributions in DM models (Hochberg, Kuflik) and novel approaches to DM detectors (Hochberg), as well as LHC searches for new physics (Kuflik). An expansion by ~ 1-2 members, with complementary interests to the DM effort, will surely facilitate the creation of an experimental group - a central ingredient in physics research. Ideally, such a group would have solid hardware capabilities, which is crucial for becoming significant players in international collaborations, and in ensuring versatility in the long run.

The group has several emeriti professors, with Rabinovici currently serving as vice president of the CERN council, and maintaining an active role as co-founder of SESAME, the Middle-East synchrotron facility where Israelis, Iranians and others collaborate.

Hard Condensed Matter Physics – Quantum Materials

The experimental condensed-matter group (Millo, Rapaport, Saar, Steinberg, Bar-Gill and Anahory) is very strong on an international scale. They cover a broad range of topics including van-der-Waals devices, strongly correlated electron systems, superconductivity, light-matter interaction, physics on the nano scale, and electronic glasses. Although Steinberg, Bar-Gill, and Anahory are fairly new recruits, they are already having impacts. Each member of this group is particularly recognized for successes in very challenging experiments. These include scanning probe spectroscopic measurements on superconductor/normal metal interfaces, as well as correlated electron materials, tunneling into monolayer stacked devices at milikelvin temperatures in high magnetic field, and

novel probes of nanostructures. This entire group benefits greatly from the Hebrew University Center for Nanoscience and Nanotechnology, which has state-of-the-art nanofabrication and analysis capabilities, and facilitates cross-collaborations among its members.

The theory group in condensed matter physics (Agam, Bettelheim, Khodas, Orgad, Ringel, Gazit) is most recognized for their work in strongly correlated electronic systems, superconductivity, and topological matter. Ringel and Gazit are new and important additions, and with Khodas, this group is promising to be strong in the fields of correlated electron and topological materials. Much of the theoretical work is in collaboration with the experimentalists, utilizing a variety of advanced analytical and numerical techniques, and in some cases, it involves interfaces with other disciplines, including high-energy physics and computer science.

3.8 Students and Alumni

Students

Students feel that the program is challenging yet are generally happy about the quality of the instruction, and about the relations with the faculty. There is some feeling that courses are understaffed.

The online resources could use some improvement: the Moodle sites are generally slow, and class videos are of poor quality. It would be useful to have class videos before the course starts, so students can prepare in advance. This is particularly true for the first year, which is especially challenging for students with inadequate physics and math preparation, and for students who completed their high school studies a few years earlier. Some students appreciate the broad admission policy.

Professors are generally very approachable and are happy to discuss physics and give advice. The students felt they would benefit from more structured mentoring. However, although HUJI initiated a university-wide mentoring program this year, only about 1/4 of the students have utilized this program.

On the other hand, students are very supportive of each other, and more senior students are happy to help newcomers with physics issues and advice.

There is relatively little social activity organized by the RI, but students appreciate the RI annual retreats which increase the cohesiveness of the Institute. These retreats highlight the top-performing graduate students and feature social activities as well as lectures on a variety of research topics.

Graduate students are generally satisfied with the program. They feel that the graduate courses are advanced and challenging. There is no formal exposure to research opportunities beyond the mandatory undergraduate course in which faculty present their research.

Students hear of potentially problematic advisors through word of mouth, and are not aware of any formal mechanism within the department to help resolve problems that they may encounter with their advisors. There is no continuous monitoring of students' progress, apart from committees formed for the MSc defense and PhD proposal and defense.

Financial support varies between different PIs. Some PIs even fund different students at different levels, and this is subject to some negotiation. The committee notes that this practice is likely to adversely affect female students.

The general assumption within the department is that successful students will pursue academic careers. There is no mentoring for students interested in other career paths, and no help for finding jobs outside academia. Nevertheless, students are aware that many opportunities exist, and one student volunteer coordinates contacts with industry, and collects information on job openings. In addition, the student union holds job fairs.

Advisors, as well as other faculty, are usually good at mentoring students about academic careers, and help them promote their research, though this is completely informal.

Alumni

The committee got the sense that the alumni enjoyed their studies at the RI and were all able to secure prestigious positions afterward, especially in industry. The alumni felt that teaching was not a high priority for faculty, and that there were strong variations in syllabus and material that was being taught between different faculty members, especially in graduate courses. The alumni were strongly encouraged by the faculty to pursue an academic path, and there was not much exposure to the alternative career routes they eventually followed.

The RI does not maintain regular contact with alumni. In fact, all the alumni with whom the committee met happened to work on campus, although in non-academic positions. The committee strongly recommends strengthening the ties with alumni, which could help expose students to different careers, and positively affect graduate students' recruitment.

3.9 Infrastructure

The startup funding provided by the RI has successfully met the needs of its recently recruited experimental faculty. Faculty laboratories of newly hired experimentalists are extremely well equipped with state of the art, often expensive tools. The RI faculty benefit from the university's support of several large research centers with shared facilities, including the nanofabrication center and the quantum center. In addition, the physics machine shop was recently renovated and is equipped with state of art tools including a 3D printing machine and a five axis CNC tool.

Some concern was expressed about the potentially harmful effect of the new light-rail system that is currently under construction on the edge of campus. If the existence of this system precludes precision experimental research in the nearby physics facilities, the university may need to consider relocation of physics to a more distant part of campus. This situation should be carefully monitored by the university administration.

The RI is distributed among five different buildings, which makes the interaction among the different faculty challenging, and impedes the cohesiveness of the different research areas.

The physics teaching laboratories look relatively well maintained. It became apparent to the committee, however, that the process by which university funding is allocated to the teaching labs is somewhat problematic. Allocations are made annually and must be spent within a given year, which does not facilitate long term planning. In addition, since the funding is channeled to the teaching labs via the RI, it is in competition with other institute expenditures, and can vary drastically from year to year. Finally, since the funding to the labs is allocated toward the end of the year, purchasing equipment for independent projects is problematic. Students in these advanced labs have access to only a very limited toolset, and often the specific equipment needed by a certain student arrives after the semester has ended.

The committee was told that there is a need for funding (approximately $1M) to purchase new equipment for lab C (the advanced teaching lab). Lab C is currently based on old experiments (electron diffraction, Co2 laser, etc.). The faculty feels that while lab B is exciting for students, the fact that lab C is so outdated can deter students from pursuing experimental physics.

3.10 Diversity

Increasing diversity is a priority for HUJI at the university level. There are about 12% undergraduate Arab students, and they plan to increase this to 18% in the

next 5 years. There are about 6% Arab graduate students and their goal is to increase this to 12%. They are also trying to increase the ultra-orthodox population, but this is a challenge because of the Haredi desire for gender separation, which is unacceptable to the university, and the poor training in mathematics characteristic of Haredi students.

For the RI, of the 40 faculty, 2 are women and there are no Arabs. The fraction of women in the PhD program is 25%, and there are 10% women post docs. The Institute leadership could not provide a number for the fraction of women at the undergraduate level.

The potential salary discrepancies among graduate students could have gender implications. Female students may be less inclined to negotiate with their advisors, which traditionally discriminates against women. There should be greater transparency regarding the situation.

Section 4: Recommendations

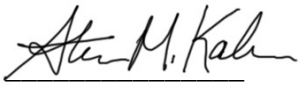
Important:

- Renovation of lab C: The experiments in lab C are very old, and in serious need of refurbishment.
- Attention to undergraduate mentoring: Undergraduates described the program as stressful, and they indicated that it was unclear to them who to turn to for advice at a personal level. The department should institute a more formal mentoring program, where faculty are assigned undergrad students to contact and meet with individually.
- Reevaluation of funding paradigm for graduate student stipends: At present, there is no fellowship money available for all grad student stipends. The support comes entirely from TAships and research grants. This is unstable, and it can lead to inequities among grad students (even within single groups) that have gender implications. The HUJI should evaluate ways to provide some general account line for grad student stipends that can be used to smooth over discrepancies, and that can provide stable funding to all students.
- Investigation of the implications of the light-rail system for experimental laboratories: The light-rail line, which is currently under construction close to the RI buildings, can have adverse implications for certain experimental laboratories. The HUJI should undertake a detailed technical study of this issue and develop a response to any problems that may be anticipated.

Advisable:

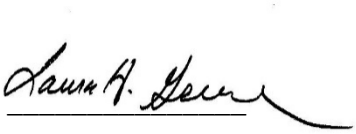
- Reevaluation of the departmental structure regarding Applied Physics: The separation between the RI and the Applied Physics department was presented to us without explanation or justification. The HUJI should reevaluate the situation to determine whether the separation between these two departments continues to make sense.
- Continued negotiation with the university regarding the space allocation on campus: The fact that physics faculty are spread across 5 distinct buildings impairs the cohesiveness of the department and inhibits collaboration. The HUJI should think creatively about ways to rectify the situation.
- Strategic planning for astrophysics: The impending retirements of two of the most productive and renowned astrophysicists at RI seriously threaten the continued health of the astrophysics program there. The RI should formulate a strategic plan to reinvigorate the program after these retirements take effect.
- Strategic planning for experimental particle physics: The recruitment of two young phenomenologists has significantly improved the RI research effort in particle physics. However, it also argues for the initiation of an experimental effort in this field. Given the central role of large collaborations in particle physics, we recommend that the department study the issue of how best to position RI with respect to the existing experimental portfolio within Israel, and across the world.

Signed by:

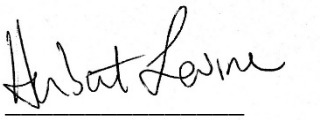


Prof. Steven Kahn

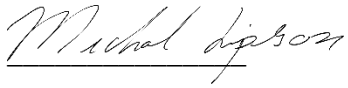
Committee Chair



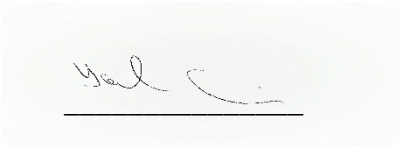
Prof. Laura Greene



Prof. Herbert Levine



Prof. Michal Lipson



Prof. Yael Shadmi

Appendix 1: Letter of Appointment

December 2018

Prof. Steven Kahn
Department of Physics
Stanford University
USA

Dear Professor,

The Israeli Council for Higher Education (CHE) strives to ensure the continuing excellence and quality of Israeli higher education through a systematic evaluation process. By engaging upon this mission, the CHE seeks: to enhance and ensure the quality of academic studies, to provide the public with information regarding the quality of study programs in institutions of higher education throughout Israel, and to ensure the continued integration of the Israeli system of higher education in the international academic arena.

As part of this important endeavor we reach out to world renowned academicians to help us meet the challenges that confront the Israeli higher education by accepting our invitation to participate in our international evaluation committees. This process establishes a structure for an ongoing consultative process around the globe on common academic dilemmas and prospects.

I therefore deeply appreciate your willingness to join us in this crucial enterprise.

It is with great pleasure that I hereby appoint you to serve as chair of the Council for Higher Education's Committee for the Evaluation of **Physics** departments. In addition to yourself, the composition of the Committee will be as follows: Prof. Laura Greene, prof. Herbert Levine, prof. Michal Lipson and prof. Yael Shadmi.

Ms. Maria Levinson-Or will be the coordinator of the Committee.

Details regarding the operation of the committee and its mandate are provided in the enclosed appendix.

I wish you much success in your role as a member of this most important committee.

Sincerely,

Prof. Ido Perlman
Vice Chair,
The Council for Higher Education (CHE)

Enclosures: Appendix to the Appointment Letter of Evaluation Committees

cc: Dr. Varda Ben-Shaul, Deputy Director-General for QA, CHE
Ms. Maria Levinson-Or, Committee Coordinator

Appendix 2: Visit Schedule

Physics - Schedule of site visit The Hebrew University Wednesday, June 5 ,2019 (Levin Building, room 12)		
09:00-09:30	Opening session with the head of the institution	Prof. Asher Cohen, President Prof. Barak Medina, Rector Prof. Berta Levavi-Sivan, Head of the Office of Academic Assessment & Evaluation
09:30-10:00	Meeting with the Dean of the Faculty of Natural Sciences	Prof. Jay Fineberg
10:00-10:45	Meeting with the Head of The Racah Institute of Physics	Prof. Nir Shaviv
10:45-11:00	**Break – at the meeting room**	**Closed-door meeting of the committee**
11:00-11:45	Meeting with the Head of the Physics Department	Prof. Ronen Rrapaport
11:45-13:00	Presentations – research groups (including research lab visits)*	3 Labs Nathalie Nadav Hadar
13:00-13:45	**Lunch at Beit Belgia**	**Closed-door meeting of the committee**
13:45-15:30	Presentations – research groups (including research lab visits)*	Nir-Astro Dror Orgad (condensed) Nadav Katz (AMO) Eran Sharon (NL) Nathalie Balaban(BIO) Guy Ron –(Nuclear) Barak Kol (HE)
15:30-16:00	Tour of teaching labs	Lab B – Brandman (Eran Sharon + John Howel + Adi Vaknin)
16:00-16:45	Meeting with BSc students	
16:45-17:30	Meeting with research students - MSc and PhD	
17:30-18:15	Meeting with Alumni	
18:15-18:30	**Break– at the meeting room**	**Closed-door meeting of the committee**
18:30-19:00	Closing meeting with heads of institution	Prof. Asher Cohen, President Prof. Barak Medina, Rector Prof. Berta Levavi-Sivan, Head of the Office of Academic Assessment & Evaluation