EVALUATION OF PHYSICS AT THE TECHNION

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 Faculty of Physics at the Technion. The Committee's visit to the Technion took place on June 6th, 2019. The schedule of the visit is attached as Appendix 2.

1.7 The Committee would like to thank the management of the Technion and the Faculty 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 Technion is Israel's leading source of technical talent driving industrial innovation. This mission absolutely demands physics training at an extremely high level. In fact, many of the best students take dual degree programs in Physics and Engineering. Thus, the Physics faculty has a dual set of tasks, maintaining distinction in forefront research, even while excelling at the service aspect. The department is successfully accomplishing these tasks and nothing essential needs to be altered.

There appears to be a mismatch between some of the administrative regulations governing employment and the clear need to hire "lab managers" for large experimental groups and possibly adjunct "teaching" faculty to help with the service load. This should be addressed in discussions with the upper management. Somewhat surprisingly, the Technion has not yet converged on a broad-ranging high-performance computing strategy and this has left several groups to inefficiently fend for themselves. Finally, some more effort to improve diversity across the board would certainly be welcome.

Section 3: Observations

3.1 Introduction

The Technion is the oldest university in Israel, and it is generally viewed as the leading institution of higher education in the country for technical fields. Often

[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.

referred to as “the MIT of Israel”, the Technion has produced alumni who now play key leadership roles in many Israeli high-tech companies, as well as in the government. The Physics Faculty is one of the stronger academic departments at the Institute, and it has maintained strong research and teaching programs in this field for many years. The current Faculty includes a number of distinguished academic scientists spanning many subdisciplines of physics. The Faculty also plays a vital educational role at the Institute because of the service courses it teaches for all of the engineering programs.

Below, we comment on our impressions of the Technion, based on our review of the Self-Evaluation report, and our in-person visit.

3.2 Organizational Structure

The Technion Physics Department acts as its own Faculty. It is managed by a Dean who reports directly to the upper management of the Institute. There is no finer level of organization within the department. This arrangement for individual Faculties is the leanest management structure we have seen among the major Israeli universities, and it appears that many of the decisions made by the department are by faculty consensus.

At the Institute level, the management structure is more complex, and a number of senior positions seem to have oversight of the Physics Faculty for various aspects of its teaching and research mission.

3.3 Self-Evaluation and QA

The Technion has an Internal Quality Assurance process, set in 1976, by which they conduct reviews of their Faculties on a recurring basis. These involve peer-reviews by panels of external experts in the given field. Shortly prior to the visit by our committee, the Physics Faculty underwent such a review by an external panel that spent several days at the Technion, and that met with the various stakeholders.

These are the conclusions of the self-evaluation process undertaken by the Faculty in preparation for both reviews:

- The Technion vision is to be one of the world’s top ten science and technology Research Universities. They perform top-rated research in the main fields of contemporary physics and have maintained a strong faculty, working to make it more international and diverse. The faculty have been successful in raising research funds as evidenced by the large number of post-docs supported by research grants.

- The Technion Physics Department is able to financially support their research and teaching demands. As they intend to grow in size and hire more experimentalists, they will need to grow their laboratory area, but finding that space will be challenging.

- They maintain and improve the quality of the graduate students by holding entrance interviews, accepting about 60% of the applicants. They continue to attract students, and last year, 25% came from other universities. Their undergraduate physics teaching programs are growing and continually improving, in Physics, and the joint programs with Math, EE, Materials Science, Biomedical Engineering, and Computer Science.

3.4 Undergraduate Education

Undergraduate physics at the Technion is dominated by joint degree programs with other fields, most notably Electrical Engineering and other technical disciplines. Only about 25% of the undergrads pursue pure physics BSc degrees. In addition, admission is more selective into the joint degree programs, and most of the better students follow those paths. There are 7 degree tracks, 3-year programs in Physics and in Physics and Mathematics, and 4-year programs in Physics with either applied optics, electrical engineering, materials engineering, computer science, or biomedical engineering. All of the above, except Physics + EE, are rostered in the Physics Faculty. The physics-related curricula for all of these programs are rather similar – the primary differences involve the complement of courses the students take in addition to physics. There is also an honors program, open to roughly 5 students per year, which provides additional attention, physics mentorship, and guaranteed participation in research at an early stage. A special introductory sequence of courses has recently been created for the physics majors and physics joint degree majors. This enabled reduced class size, and greater flexibility to discuss current physics topics.

Undergraduates are strongly encouraged to get engaged in research, and many do by their third year. There are “research project” courses that provide academic credit for such endeavors.

While students were mostly happy with the program, the lab courses seemed to be less popular. Students feel that these courses take a lot of effort, and they do not get enough academic credit for them, given the workload. Also, there is a desire to have more lab instructors. Students feel that they get only minimal feedback for the work submitted.

Only some of the Physics courses are video recorded. It is especially important to try to rectify this, since the size of the classes in the first two years tends to be quite large.

The Technion has a reputation for "grading hard", resulting in lower GPAs for Technion physics students than at other universities. Nevertheless, Technion graduates appear to do well career-wise, and are well-represented both in industry and academia.

It is not uncommon for students to take longer than the nominal period (3 years for the pure physics, 4 years for physics plus technical field) to complete their BSc degrees. Some find the degree overwhelming, although the dropout rates are not noticeably higher than at other institutions. The Technion leadership expressed the point of view that students come to the Technion to work, not to have fun. That may be true, but intense academic pressure is not ideal for some students, and it can further inhibit diversity and inclusion.

3.5 Graduate Education

The graduate program at the Technion is similar to that at other universities in Israel and the United States. There is a 2-year MSc program, a 4-year PhD program, and a direct PhD track. Students are required to take Quantum Physics and Statistical Physics, plus a selection of elective courses. A thesis is required for the award of an MSc degree. For the direct PhD track, students can skip the master's thesis and go directly into PhD research, receiving an MSc along the way.

Faculty in certain fields expressed some concern about the significance of the current required courses, and the lack of requirements for some other courses that are more relevant to their own research work. Examples of material that is NOT covered in required courses, and that most students never learn, include basic fluid dynamics and non-equilibrium statistical mechanics. These are topics that are important for biophysics and astrophysics, among other fields. Such comments beg the question of "what counts as physics?", and "what material is it essential that students learn before they are awarded PhD's in physics?" As the field evolves, it is important to reevaluate such questions to ensure that the graduate program remains vital and well-matched to cutting edge research in physics.

Financial support for graduate students is stable and competitive with that offered at other Israeli universities. A healthy fraction of the student support comes from university fellowships, beyond that provided by TA-ships and through research grants. This is working very well.

3.6 Faculty and Human Resources

Faculty hiring is focused on returning Israeli postdocs, as is the case at most of the other Israeli universities. The Technion recognizes the problem of bias in selecting their own PhD graduates, which could lead to a stagnant inbred faculty. We were told that there is an informal system of requiring a Technion graduate to have at least one other offer before he or she can be proposed for a hire. As in other places, there is an overall desire to hire more foreign faculty, but we did not see any direct evidence that this was actually happening to a significant degree; other universities seem to have been more successful at making appointments to foreigners. Almost all faculty are eventually granted tenure, which makes the initial hiring process at the junior level especially crucial for assuring research and teaching excellence.

A hiring issue that the Department currently faces involves impending retirements in the areas of general relativity and plasma physics. If those retiring faculty are not replaced, there will be nobody working in those research fields within the department. Our perspective is that there should not be any absolute requirement for the Technion to cover every single possible area of physics, and retirements offer the chance to move the Faculty towards more vibrant subfields. There are sure to be some teaching challenges that could arise from this, but these can probably be handled in other ways.

Informally, the department seems heavily focused on quantum systems (condensed-matter, AMO), sometimes causing a degree of resentment in the "classical" groups (astrophysics, soft-condensed matter). This attitude manifests itself in concerns about hiring priorities, and also in some curricular matters (see below). Such rivalries between fields are not healthy, and we believe they should be confronted directly, through active discussions led by the Dean.

There appear to be several human resource issues and concerns for Technion physics. First, there are no separate slots for teaching faculty. As the Institute as a whole is focused on science and engineering, there are many large service courses that need to be taught by Physics. At many other universities, this extra load is taken up by adjunct faculty, although that is not always an ideal solution as it can compromise the quality of the introductory courses. The absence of a "teaching line" at the Technion precludes that solution, but it means that the teaching load is high for regular faculty. We suggest that the Faculty reconsider its current strategy to see whether establishing a teaching line might be warranted.

A more serious problem is that there is no separate track for high-level PhD's to work as ``lab managers". This issue was raised in discussions with several of the research groups, and it appears to be endemic to the existing Technion structure. The problem is generic to the way physics is supported at most

universities in Israel, and we discuss this issue in more detail in the general section of this report. At the Technion, the financial support for such technical personnel is not the primary concern; the Institute provides 50% of a technician salary for each lab and most of the groups are sufficiently well-funded from the ISF and from ERC grants to cover the remaining cost. However, the key problem is that there are no specific long-term slots with tenure for such positions. This makes it very difficult to hire such individuals and retain them, given the intense competition for such people from the high-tech sector. Attention to this matter would positively affect both existing research efforts as well the ability to attract new experimentalist hires.

There is a fairly sizable postdoc population supporting the Faculty, the majority of which are foreign. We did not meet with any of them (mostly because they were not explicitly included in the agenda prepared by the CHE), so we have no firsthand information about their experiences and concerns. We were assured that the unique needs of this community are being handled by the Technion and not left to the vagaries of individual groups. We do believe there should be a greater effort made to evaluate the overall postdoc strategy including tracking how these individuals fare after leaving the Technion.

3.7 Research

AMO and Non-Linear Optics

Research related to AMO and Non-Linear Optics within the Physics Faculty is extremely strong and well-funded. Faculty (Cohen, Sagi, Steinhauer, Segev) are involved in topics that are of high interest to the broad community, such as: photonic topological structures, excitonic polaritons, deterministic generation of pure single photon states, analogues to Hawking's radiation and strongly interacting Fermi gases. The research is highly cited. The faculty have ties and connections with top researchers around the world. These small groups would benefit from stronger interactions among themselves and with the rest of the Faculty.

Astrophysics & Relativity

There are 7 active faculty engaged in research in astrophysics and relativity, 6 theorists and 1 involved in observations and instrumentation. Among the theorists, Nusser and Desjacques are cosmologists studying large-scale structure and galaxy formation, Laor works on massive black holes and active galactic nuclei, Soker and Perets work on stellar dynamics, supernovae and planetary physics, and Ori is a relativist. Behar has a background in X-ray spectroscopy but is more recently devoting himself to a space experiment to measure the electromagnetic counterparts of gravitational wave events. Of these, Ori is the closest to retirement.

The astrophysics group is strong and contributes respectively to the overall Israeli effort in this field. It would be advisable to increase the fraction of observers in the Group through future appointments. The Technion astrophysicists are supportive of the proposal for Israel to seek membership in the European Southern Observatory (see the general section of this report), which will make it easier to attract observers and instrumentalists. In addition, since many of the theorists rely on numerical techniques for their investigations, they could benefit from a more coherent approach to high performance computing on the campus.

Particle Physics

The particle physics faculty include three experimentalists (Tarem, Rozen, and Kajomovitz) engaged primarily on ATLAS, and six theorists (Bergman, Yarom, Razamat, Shadmi, Bloch, and Soreq). In collaboration with the Weizmann Institute for Science and Tel Aviv University, the experimentalists have played key roles in the ATLAS upgrade on the muon system and the triggers. They have also each contributed individually to various physics analyses on ATLAS. Among the theorists, Bergman, Yarom, and Razamat are string theorists, who study various formal aspects of quantum field theories and dualities relating gravitational theories to quantum fields. Shadmi, Bloch, and Soreq are phenomenologists studying various aspects of beyond the standard model physics. The mix of experimental work, phenomenology, and formal theory is especially good at the Technion, leading to a fairly comprehensive program in particle physics.

The primary concerns of the Group pertain to the stability of the experimental program. In particular, as for other experimental groups in Physics at the Technion, there is a shortage of technical personnel to assist with the experimental program. The problem does not seem to be financial, but relates instead to the inability to offer technical positions with an appropriate mix of job security and salary so as to compete with opportunities in industry. This is a generic problem for the Faculty that requires creative solutions.

Plasma Physics

There is one faculty member, Yakov Krasik, engaged in various aspects of plasma physics research, ranging from warm dense matter to microwave interactions with plasmas, and high-power microwave generation. This work is well-funded and utilizes a variety of experimental facilities on campus. However, it is fairly decoupled from the other research carried out in the Faculty, and Krasik is nearing retirement, so the future of this experimental program is in doubt. We suggest that the Faculty undertake a self-study to investigate the pressing problems in plasma physics moving forward, and their relevance to other fields of physics, before proceeding to replace Krasik with another plasma physics

appointment. There are potential interesting connections to astrophysics and nonlinear physics which could be explored, if a suitable candidate can be identified.

Biophysics/Statistical Physics

The Technion has a strong group in this area, covering a broad range of topics at the forefront of several parts of this field. Highlights include the prize-winning work on quasicrystals (Levine), the ongoing work on mechano-biology at the cellular and multicellular scales (K. Keren), work on DNA and other active systems (Kafri, Bunim) and research on biological adaptation under stress (Braun). In addition, there is the pioneering work by Uri Sivan and co-workers on biophysics combined with nanotechnology. It is very exciting to hear of the imminent arrival of Anna Frishman to round out the effort by bringing a more non-linear physics perspective to the Group.

While it is clear that the Group is functioning well, there are some issues that may need addressing. These issues include availability of appropriate HPC facilities, curriculum limitations, and as with all other groups, the possibility of hiring advanced lab managers. For the curriculum, the heavy focus in the coursework on quantum phenomena at the expense of, for example, non-equilibrium statistical mechanics is problematic for preparing students for research. This problem also affects other fields with significant “classical” components such as astrophysics and plasma physics. This was discussed above. This group also has lab manager needs in line with what has been discussed above.

There is a critical issue for many universities both in Israel and worldwide in the field of applying physics to biology. Typically, this field is researched by faculty from multiple disciplines including physics, chemistry, biology, bioengineering, and in some cases, mathematics and computer science. This creates an obvious problem and also an obvious opportunity. We encourage the physics component of this physics of living systems community to foster mechanisms (some of which may already exist, for example through the Lokey Interdisciplinary Center for Life Science and Engineering) to couple scientifically-connected people and projects that cross academic boundaries at the Technion.

Hard Condensed Matter (Quantum Materials)

The experimental condensed matter physicists (Gershoni, Hacohen-Gourgy, Kanigel and A. Keren) are strong in optical properties of low-dimensional systems, superconducting circuits, studies of low-dimensional correlated electron systems using transport and ARPES, novel superconducting and magnetic systems.

The theory group (Akkermans, Auerbach, Lindner, Podolsky, Reznikov, and Turner) is recognized for its work in quantum, statistical, non-equilibrium, and mesoscopic physics, strongly correlated electron systems including superconductivity and magnetism, topological materials, and the quantum Hall effect. Every one of these faculty members is recognized on an international level, following in the eminent path of emeriti, including Koren, Polturak, and Shapiro.

There is a consensus that more experimentalists in this area are needed, since they make up less than half of the members. This is not an issue of funding, but rather that the candidate pool is low. One reason might be that many students choose industry over academia in this field.

3.8 Students and Alumni

Students

Students are generally proud to be enrolled in the Faculty and expressed happiness with the program. They are comfortable with the curriculum and expressed praise for the pedagogy and the quality of the teaching, overall, although there are exceptions. They also appreciated the fact that they are being exposed to a multitude of career options via organized tours to industries nearby and talks by alumni.

Graduate students at the Technion are generally quite happy with their experiences there. The faculty are open and interactive, and students found their courses and research work to be useful and productive. Graduates are well-trained and have done well in their subsequent careers.

Alumni

In general, the alumni enjoyed their studies at the Technion, and the fact that they were able to secure prestigious positions, especially in government labs. The committee commends the recent efforts of the department to develop relationships and strengthen ties with the alumni body.

3.9 Infrastructure

The research labs of recruited faculty are very well outfitted with state-of-the-art equipment. This has been facilitated by university support for startup packages that is competitive with that provided by top US universities today.

The teaching labs have been recently renovated and include modern instrumentation.

There is an issue regarding the provision of high-performance computing at the Technion. There are several strategies that have been pursued by the various research groups that require access to such facilities: (1) purchasing their own clusters, which are then managed by a central facility; (2) utilizing clusters maintained by other groups; or (3) buying time at a centralized university facility. None of these alternatives is optimal in many cases, either because the costs are too high, or because the resources available are not well-suited to the groups' particular needs. The dearth of high-performance computing in Israel is a generic problem for physics at nearly all the universities.

3.10 Diversity

The Technion has espoused a commitment to increasing the diversity of their student and faculty populations, and the Institute's record can be commended in several areas. About 20% of the undergraduate students are Arab, which can be attributed in part to the Institute's efforts at working with Arab high-school students to prepare them for admission. There are also 90 Haredi undergraduate students, again, partly due to the fact that they built a separate program for them, including an 18-month long preparation course. For Haredi students, however, the absence of gender segregation is often the key issue for successfully integrating them into the university, and the Technion has indicated that they will not accommodate such requests. The Institute also supplies scholarships for family needs of Haredi students, and is working on ways to help support men and women who have abandoned their Haredi roots for the academic world.

In Physics, there are 40 faculty members, six of whom are foreign, one is Arab, and three are women. This past year, one of the women and one foreigner have been hired. Of the 26 post docs, 19 are international and two are Arabs. We were not able to discern the number of women postdocs, as the Faculty did not have that number at hand. The graduate population is about 20% female.

While the Faculty and the university are indeed committed to diversity, these numbers are still low, and increased attention to this general issue is needed.

Section 4: Recommendations

Important:

- Reconsideration of additional methods for increasing the diversity of the student and faculty populations: While the Technion has shown a strong commitment to diversity, the Faculty should investigate potential ideas to further improve the situation. Particular attention should be given the impediments for hiring women faculty, e.g. the requirement that all candidates pursue postdoctoral positions outside Israel, the focus on native Israeli candidates, etc. Since the number of Arab and other minority

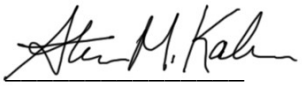
candidates is small, the Faculty should consider how to respond when outstanding minority candidates emerge.

- Investigation of alternative approaches to the hiring of laboratory support scientists and engineers: Given the potential lack of job security and the relatively low salaries compared to those available in industry, it has proven difficult to recruit and retain adequate personnel for these laboratory support positions, which are crucial to the research enterprise. The Institute should investigate creative approaches to making these positions more attractive to the candidate pool.
- Detailed study of alternatives for meeting the high-performance computing needs of the Faculty: The Institute should undertake a formal study to evaluate its options for HPC, and the cost that it charges to users of the central facility. This is an evolving situation, given the increasing availability of cloud computing resources, so it is a complicated issue requiring a thoughtful approach.
- Reevaluation of the student labs: The lower level student labs appear to be more "cookbook" than they need to be. These should be reexamined to see if it is possible to give the students more opportunities for self-direction in the performance of these exercises.

Advisable:

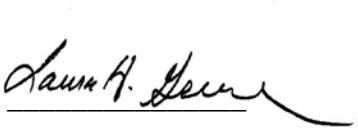
- Efforts to achieve better interactions between the subfields within the Faculty: The various subdisciplines do not feel that they have equal priority for future hires and other considerations. The Physics Head should spearhead a frank discussion of such issues within the Faculty to address such issues.

Signed by:

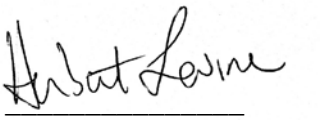


Prof. Steven Kahn

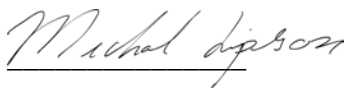
Committee Chair



Prof. Laura Greene



Prof. Herbert Levine



Prof. Michal Lipson

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 Technion Thursday, June 6 ,2019		
09:00-09:45	Opening session with the head of the institution	• Prof. Peretz Lavie, Technion President • Prof. Uri Sivan, Technion elected President • Prof. Adam Shwartz, Senior Executive Vice President • Prof. Alon Hoffman, Deputy Senior VP • Prof. Zalman Palmor, Executive VP and Director General • Prof. Wayne Kaplan, Executive VP for Research • Prof. Hagit Attiya, Executive VP for Academic Affairs • Prof. Boaz Golany, VP for External Relations and Resource Development • Prof.Hazzan Orit, Dean of Undergraduate Studies • Prof. Givoli Dan, Dean of the Graduate School
09:45-10:45	Meeting with the Dean of the Physics Faculty	
10:45-11:00	Break	Closed-door meeting of the committee
11:00-13:00	Presentations – research groups (including research lab visits)*	Statistical Physics and Biophysics Group meeting Prof. Uri Sivan, Prof. Dov Levine, Prof. Erez Braun, Prof. Yariv Kafri Prof. Kinneret Keren, Prof. Guy Bunin Condensed Matter Group Prof. Assa Auerbach, Prof. Eric Akkerman, Prof. Daniel Podolsky Prof. Ari Turner, Prof. Netanel Lindner, Prof. Amit Keren Prof. Michael Reznikov, Prof. Amit Kanigel, Prof. Shay Hacohen-Gourgy Cold Atoms Laboratories Associate Professor Jeff Steinhauer Visit to Plasma Labs Prof. Yakov Krasik
13:00-13:45	Lunch	Closed-door meeting of the committee
13:45-14:30	Presentations – research groups (including research lab visits)*	Astrophysics and GR Group Prof. Noam Soker, Prof. Ari Laor, Prof. Amos Ori, Prof. Adi Nusser Prof. Ehud Behar, Prof. Hagai Perets, Prof. Vincent Desjacques High Energy Physics Group Prof. Oren Bergman, Prof. Shlomo Razamat, Prof. Boris Blok Prof. Shlomit Tarem, Prof. Yoram Rozen, Prof. Enrique Kajomovitz

14:30-15:00	Tour of teaching labs	Dr. Yulia Preezant - head of TeachingLabs
15:00-15:45	Meeting with BSc student	
15:45-16:30	Meeting with research students	
16:30-17:15	Meeting with Alumni	Dr. Ayelet Hashahar Devir- Wolfman, Chen Avinadav Liad Levy, Dr. Ori Scaly
17:15-17:30	Break	Closed-door meeting of the committee
17:30-18:00	Closing meeting with heads of institution, Dean of the Faculty and the Head of the Physics Department	• Prof. Peretz Lavie, Technion President • Prof. Uri Sivan, Technion elected President • Prof. Adam Shwartz, Senior Executive Vice President • Prof. Alon Hoffman, Deputy Senior VP • Prof. Zalman Palmor, Executive VP and Director General • Prof. Wayne Kaplan, Executive VP for Research • Prof. Hagit Attiya, Executive VP for Academic Affairs • Prof. Boaz Golany, VP for External Relations and Resource Development • Prof.Hazzan Orit, Dean of Undergraduate Studies • Prof. Givoli Dan, Dean of the Graduate School