Standpunt van het Bestuur van de Faculty of Science and Engineering t.a.v. de aanbevelingen van de Peer Review Commissie neergelegd in het visitatierapport (periode 2011-2016) van de onderzoeksinstituten VSI, ZIAM, ENTEG, Stratingh Instituut, GBB, GELIFES en de Graduate School

Aanbevelingen die de faculteit betreffen:

The committee recommends to more strongly emphasize and support the engineering science aspects of FSE in its policy.

Het bestuur onderschrijft deze aanbeveling. De Stuurgroep van het Groningen Engineering Center (GEC, voorzitter Prof. Scherpen) heeft inmiddels de opdracht gekregen om een toekomstvisie te ontwikkelen op het engineering opleidingenpallet van de faculteit en te adviseren t.a.v. een facultaire visie op het engineering onderzoek.

The committee recommends introducing such an advisory board for each institute; such a sounding board of experts with an outside view is considered to be very valuable. The size and position of a scientific advisory board should be dependent on the size of the institute. Nevertheless, even small institutes might strongly benefit from such a board.

Het bestuur onderschrijft het nut van een advisory board voor onderzoekinstituten en verwacht van elk instituut dat het een dergelijk advieslichaam heeft danwel inricht. Echter, een aantal instituten neemt deel aan landelijke programma's die een sterke advisory board hebben, in welk geval het bestuur van oordeel is dat een apart lichaam voor het instituut geringe meerwaarde heeft.

It is strongly recommended that care is taken to ensure that the engagement in China is balanced, so the teaching load there does not become a drain on senior faculty at FSE. It is important that sufficient senior staff remain in Groningen …..

Het FSE-bestuur heeft met het College van Bestuur een aantal voorwaarden afgesproken die de garantie bieden dat FSE-staf, zowel senior als junior staf, niet overbelast wordt met verplichtingen die gerelateerd zijn aan Yantai.

The mentoring of a TT candidate after getting tenure should not be considered superfluous……. Mentoring and professional development continue to be beneficial throughout a faculty member's career.

Het faculteitsbestuur is bezig met het opstellen van een update van het loopbaanbeleid voor wetenschappelijke staf (Bèta's in Banen) en een Talent Development Plan. Mentoring en de professionele ontwikkeling en begeleiding gedurende de hele loopbaan zijn daarbij belangrijke aspecten.

The committee wants to reiterate that also specific training and supervision should be provided to the postdoctoral fellows.

Het bestuur is het hier geheel mee eens en heeft in 2016 twee werkgroepen ingericht om nader te adviseren over het postdocbeleid in de faculteit. Mede op basis van hun adviezen is in 2017 een postdoc council ingericht, zijn twee postdoc-ambassadeurs benoemd die rechtstreeks contact onderhouden met het faculteitsbestuur en is een facultaire HR-adviseur voor postdocs benoemd, die

onder andere als taak heeft het trainingsaanbod en de loopbaanbegeleiding beter gestalte te geven en onder de aandacht van de postdocs en hun begeleiders te brengen.

The committee recommends that need and allocation of technical staff across the faculty is more in depth investigated.

Het FSE-bestuur zal de historische ontwikkelingen in de onderzoeksinstituten wat betreft de ratio technische versus wetenschappelijke staf in kaart laten brengen en dit bespreken met de instituten. Het FSE-bestuur is voornemens om een werkgroep in te stellen die deze acties kan begeleiden.

A key issue may be that it is not sufficient to only attract female researchers in at junior level, but that at the same time females should be brought in at senior (full professor) level. ……. The committee also recommends FSE to carefully analyse why some institutes are more successful than others in attracting, and in holding on to, senior female staff.

De gender ratio is een regelmatig terugkerend onderwerp van overleg tijdens de bestuurlijke overleggen met de instituten. Het punt van werven en behouden van (vrouwelijk) talent krijgt speciale aandacht in het Talent Development Plan dat begin 2018 zal worden vastgesteld. Best practices van instituten die succesvol zijn bij het aantrekken en behouden van vrouwelijk talent worden daarbij faculteitsbreed (en instellingsbreed) uitgewisseld. Het breed adverteren van meerdere vacatures tegelijkertijd blijkt meer vrouwelijke kandidaten te trekken en leent zich ook voor het stellen van quota (hetgeen al met succes is gebeurd). Ook recruiters worden ingezet om meer vrouwelijke kandidaten te interesseren voor vacatures. Verder is een adequaat partnerprogramma essentieel om goede kandidaten te werven en vast te houden. Mede op aandringen van het FSE bestuur is op instellingsniveau “dual-career” ondersteuning georganiseerd (middelen en menskracht). Voor het vasthouden van kandidaten zijn verder met name aspecten zoals collegialiteit, introductie in landelijke netwerken en mentoring cruciaal.

ENTEG

Risk of fragmentation

The ambition of building a technology driven scientific research programme in engineering in its broadest sense carries the risk of covering too many research topics, each with too little critical mass. Although growth of the institute over the past period is impressive, the committee wondered if with this many research areas the institute is spreading its resources too thin and recommends defining a set of prioritized focus areas or disciplines. …

.. priority should be given to collaborations across domain areas within ENTEG e.g. in the form of ear-marked PhD or postdoc scholarships to build synergy between and across existing and successful research domains.

*The committee recommends that ENTEG develops a strategy towards the future based on fostering and further developing existing internal collaboration and to further stimulate coherence (*taking into account Yantai and our unique position in the Netherlands as an engineering institute in a comprehensive university*). … the committee has some concerns with respect to the future if the institute does not carefully draft a strategy with clear process criteria as well as measurable quantitative and qualitative deliverables.*

Indeed, the risk of scattering resources and growing too fast has been a concern already since the establishment of ENTEG. The need for consolidation and sustainability is recognized. We are convinced that via the described planned growth the critical mass in certain research area's will increase as well as the coherence within the institute by bridging the currently experienced gaps between the research. ENTEG's research activities are typically carried out in one of three domains described in the self-evaluation report.

- Domain 1 - Product and production technology chemicals and performance products
- Domain 2 - Systems and control
- Domain 3 - Smart manufacturing of complex materials

The University of Groningen (UG) was recently granted permission to start a mechanical engineering master program. Soon, new scientific staff will be recruited to enforce UG's strength in this area. These new staff members will be embedded within ENTEG. A strategic plan for recruitment including a timeline for the next couple of years is available. The current plan will result in:

- research in all the above described domains will be enforced with new tenured and tenure track staff.
- research in domain 3 will be strengthened with two new base units, one in Engineering Materials and one in Dynamics and Vibrations. Especially the group Dynamics and Vibrations will be positioned in between domain 2 and 3, and as such form a bridge between the research in those domains.
- via a new base unit in Process Design the currently experienced gap between research in domain 1 and 2 will be bridged.

The institute will set up a strategy that includes criteria as mentioned by the committee such as output, citation analysis levels and earning capacity.
Additionally, we mention that the institute, despite its limited (financial) tools to create incentives for collaboration within the institute, will follow the suggestion of the committee by assigning a number of PhD scholarship positions to cross disciplinary PhD-research projects in the institute.

Strategy towards societal relevance
The committee considers that by more strategically considering outreach activities, overall impact could be enhanced and more easily measured.
The committee recommends that the institute should build in a "visualization" of publications with industrial collaborators. This is an important feature with respect to societal relevance and also counts at the level of international grant applications.

Indeed, the strategy of the institute with regard to societal relevance may be more implicit than explicit and the institute will take up the suggestion of the committee to draw up a more explicit policy document.
In this context we also wish to mention that:

- ENTEG intends to make explicit which senior staff represents the institute within specific collaborative industrial clusters related to the Northern region such as the Region of Smart Factories, Biobased economy, Chemport Europe etc. These staff members will be requested to report to the ENTEG board and staff meetings on a regular basis.
- ENTEG staff sees it as part of their responsibility to participate in outreach activities and does so on a regular basis. Outreach contributions are a point of discussion during the yearly research and development interviews. Additionally, staff is expected to archive their activities in our current Research Information System PURE. The institute will set up mechanisms to follow up on this more explicitly, and more structurally support staff when possibilities for outreach arise. Furthermore, the institute will add outreach activities on the website in a structured manner, and more carefully register those activities at institute level.

ENTEG appreciates the suggestion to build in a “visualization” of publications with industrial collaborators. The Institute will make it more explicit when relevant. However, it should be noted that a publication overview with industrial partners will never be complete, since some of the industrial partners do not want to exhibit their interest in specific research topics publicly to their industrial competitors, and thus do not want to be co-authors.

Technical staff
The increase of technical staff has lagged behind the increased number of research staff. Further growth of the institute should be followed by adequate growth in technical and laboratory support staff.

ENTEG recently submitted a request for additional technical staff to the Faculty Board and will follow up with supplementary requests in connection with the appointments of some of the above mentioned new staff members. (dit is al geconcretiseerd, graag vermelden hoe)

Flagships
The committee should like to recommend to make room for fundamental research in engineering closely tied to applied research and to use “flagships” such as e.g. the Ocean Grazer to generate collaboration across ENTEG.

Via a ‘flagship’ as the Ocean grazer the institute indeed manages to enhance collaboration across ENTEG and enhance the bond between fundamental research in engineering and applied research. This collaboration is expected to become even stronger in the future. In addition, the institute does so in ‘flagship’-projects such as Smart Factory (together with the institutes JBI and ZIAM) or the Carbohydrate Competence Center (with Stratingh Institute and the institute GBB).

Complementary content
Plans to join 4TU is recommended as long as the motivation to do so also focuses on complementary content. Also, the Groningen Engineering Center should represent more than just branding “engineering”. The committee recommends that FSE at faculty level provides more structural and explicit support with respect to the engineering ambition of the Faculty

The institute fully supports the recommendation of the committee to focus on complementary content, and has already been planning to take this into account for setting up the new future strategy plan. We are pleased with the committee’s confirmation that there is a clear value in further bridging science, technology and engineering and the expected opportunities with respect to science, societal relevance and funding.
Part of our efforts will remain focused on promoting UG as a university where engineering science is done in a classical university, i.e., emphasizing the unique position of UG in the Netherlands with engineering research embedded in a comprehensive environment. As such we aim to be recognized as an important player in the field of engineering science in the Netherlands. We are pleased to be able to mention that we already see results of our ongoing efforts; for example, in 2018 UG/Groningen Engineering Center is asked by the Dutch Royal Institute of Engineers (KIVI) to host their yearly Engineering's Day.
With regard to supporting the engineering ambition, the Faculty Board has recently approved of the opening of …????. additional fte in engineering disciplines within the faculty, all endowed with start-up funds, and it has supported the foundation of the Groningen Engineering Business Center, which was approved for regional funding in November 2017. In addition, plans are under development to construct additional lab space specifically for large engineering activities, amongst others the Ocean Grazer.

GBB

Societal Relevance
…..But, relevance to society could be further enhanced by encouraging junior and senior staff members to develop and carry out clear and well-supported outreach plans.

A lot is already being done on outreach within the GBB (see annex 1). The relationship with industry is traditionally sought in public-private partnerships and the generation of IP. The relevance of this has been made clear, among other things, and is also recognized by the PRC; the GBB board expects that this will be maintained in the coming period. Much attention is also paid to various forms of professional and public outreach, however registration can be improved. In annex 1 some points of attention are formulated and the GBB board, together with the staff members and the GBB Office, will make an improvement.

Viability
It is clear that GBB is on very solid scientific ground doing excellent work and now it seems entering a transition phase. Upcoming retirements provide opportunities as well as uncertainties. The committee recommends that in the near future the institute develops a clear vision and strategy that is broadly supported. Once GBB succeeds in defining and implementing where they want to go and how to get there, the viability will become excellent.

Indeed GBB is broadening its scope towards more health-related systems, but will keep his focus on molecular mechanisms of biomolecular and cellular systems. The transition towards mammalian systems is already effective; excellent opportunities for further steps for this broadening of this scope will become available with the filling of the upcoming vacancies. The actual direction in mammalian cell biology will depend on the first recruitment(s) of high-profile scientists, who will then (together with existing younger staff) be involved in further shaping of the institute.
This is not a lack of vision but the 'people-based' strategy of any top institute. GBB is active and expanding in fields that are among the most competitive and thus recruitments are guided by quality first. Very recently, one of the Netherlands top scientists accepted the chair in Molecular Immunology at GBB. This now settles the direction that will be taken in mammalian cell biology.
Furthermore, the recruitment for two new staff members is in the fields of Host-Microbe Biology and Molecular Genetics (start of second half of 2018).

Appropriate facilities for tissue culture and animal experiments have been realized to enable the research on the structure of mammalian proteins, and to respond to the wishes of a part of the senior staff not to be restricted to lower eukaryotes in their research. The 'broadening' activities fit perfectly with the themes Molecular Life & Health of FSE and Healthy Aging of UG and are in line with the revision of the educational program in Life Sciences.

GELIFES

The institute will have to work hard to bring the various research lines together, especially where overlap in research topics with other groups is less obvious, such as neurobiology.

Based on the number of collaborations that the Neurobiology group initiated via the Adaptive Life PhD positions with other expertise groups of the institute, which is no less than that of other groups, and their similar diversity in expertise compared with the other groups, as well as the successful

development of the new theme evolutionary medicine we do not experience neurobiology to be less integrative than the other groups. However, we do realize that continuous effort is required in the next five years to foster the institute's interdisciplinary research further, with the aim to become the world top in integrative evolutionary life sciences. To this end the institute will organize retreats for the scientific staff on these topics, utilize the integrative topic groups further, secure high-quality research in the integrative PhD positions, publish high-impact opinion papers and organize international conferences to put the institute's approach in the frontline of research, and set up a policy of how to fill in the PI positions that will become vacant in the coming 5 years. The Faculty Board and the institute's management, in biannual administrative meetings, discuss progress and, in particular, also assess to what extent the chosen organisational structure is optimal to reach the institute's goals.

…. the institute should aim to acquire more external funding to supplement the direct funding provided by the faculty, and acquire more personal research grants as that will stimulate own research lines of young researchers.

We agree that the external funding should increase to realize the institute's ambition and to take over the generous funding of Adaptive Life in the coming years. The institute has already implemented a range of measures to increase external funding. These include among others individual funding plans (including strategies to gain more personal grants and becoming part of international consortia), more stringent standards for efforts concerning grant applications to be discussed during the staff's annual appraisal interviews, internal quality checks on grant applications, appointing a funding officer connected to the Competence Centres, and a policy that explores funding sources other than the traditional funding for fundamental research.

…the institute should work on improving its gender balance and PhD completion rates.

We agree that the duration of many PhD trajectories is currently too long and that staff of GELIFES is too strongly male-biased. During the past year, the institute implemented a range of measures to reduce the duration of PhD trajectories that were received by the graduate school with enthusiasm. (See also the paragraph of the Graduate School),
The institute was successful in hiring three new female scientists in its most recent four appointments, including one at the associate professor level, and hence work actively to a better gender balance. For the fifth position a recruitment bureau will help to find suitable candidates at the level of associate or full professor, preferably a woman.

Stratingh Institute

The evaluation panel was deeply impressed with the overall performance of the Stratingh Institute, and did not formulate any specific advice regarding the future.
The evaluation panel, though, formulated a general advice for an International Advisory Panel for those FSE institutes which do not have one already in place. The board of the Institute considered this advice. However, as the Stratingh Institute already benefits from the international advisory boards of the large initiatives mentioned in the self-evaluation: FMS (The Research Center for Functional Molecular Systems), ARC-CBBC (Advanced Research Center - Chemical Building Blocks Consortium), FOM-Focus Group Groningen "Next Generation Organic Photovoltaics", we consider it redundant to appoint a 4th International Advisory Panel specific for the Stratingh Institute. We believe that the three existing advisory panels, together with the regular research assessment exercise cycles, and the strategic plans of the faculty and the university provides sufficient steering advice.

Van Swinderen Institute

The committee thinks that VSI does an excellent job in connecting theory and experiments. Particle physics in particular is well-connected to the experimental research. The interface between gravitational research and experiments could further be strengthened.

Research at the VSI is currently along the lines of three Frontiers. The Cosmic Frontier was lacking experimental research at the time of the evaluation. Since then, the institute has attracted a professor by special appointment, who is an expert in the data analysis of gravitational wave research performed by the LIGO/Virgo collaboration. Thereby, the institute has added a very promising branch of research in the Cosmic Frontier that is on the interface of theory and experiment and that will attract excellent physics students. In addition, the recent departure of one of our staff will open new opportunities to strategically hire new staff.

Due to the nature of its research, the institute is not connected to any of the Faculty's research themes and thus misses out on the additional funding opportunities this provides. The committee recommends the Faculty and the institute to reflect on whether a match could be made between VSI and some of the research themes.

The institute has started a joint research initiative called 'Fundamentals of the Universe', together with JBI, Kapteyn, and KVI-CART. This is currently a research priority of the Faculty and it is close to route 2 of the NWA. These institutes are challenged by the Faculty Board to demonstrate their ability to jointly be competitive, both in research and grant acquisition, before this priority area may be considered to become an (additional) faculty research theme. In addition, the institute currently actively pursues other routes to connect to other research activities in the faculty, one of them being earthquake related research.

Also, the institute has to deal with the decrease in technical support caused by the detachment from the AGOR facilities. The Nikhef consortium partly compensates for the decrease in technical support, but it cannot completely replace the on-site technical support the AGOR facilities provided.

The institute's management, assisted by the Faculty Board, will consider this issue in the nearest future and open new discussions with the KVI-CART management in order to arrive at a satisfactory solution.

The committee noticed that the institute currently has a relatively small number of postdocs compared to the number of PhD students. The institute could possibly benefit from a more balanced research team, where PhDs have the opportunity to learn from postdocs, and postdocs from each other.

Even though the financial situation of the institutes stimulates a strong bias towards appointing PhD students, increasing the number of postdocs has become an immediate priority for the VSI. Due to the limited budget of the institute, VSI has to approach this situation with external and Faculty funding. The Faculty's new postdoc initiative to help reducing the student-staff ratio, offers welcome opportunities. In addition, VSI will submit dedicated grant applications for postdoc positions.

Zernike Institute for Advanced Materials (ZIAM)

The current director of ZIAM was recently appointed (….) and took over in a turbulent time, with the excitement of a Nobel Prize within the Stratingh Institute and the prospect of a huge private investment in the institute (see Viability). The committee recommends (…) to thoroughly discuss (…) promising future perspectives and to frequently seek advice from colleagues inside and outside the institute (…).

The institute has several layers of structural meetings installed that safeguard the suggested discussions e.g. staff-lunches, brainstorm sessions for internal discussion, Focus Area Leaders (Stratingh Institute 2 of 4, GBB 1 of 4) and International Advisory Panel for external advise. Besides this, the institute engages with experts in interfacing disciplines like computer science or medical sciences and has them structurally involved in meetings on topics related to their expertise.

The institute will prepare and work out significant new developments for its research future, and discuss its strategy and choices for this both internally and with external advisory panels. For new themes and developments new advisory panels will be installed.

Relevance to society
(…) the institute could do better in its approach towards society at (…). The institute's outreach activities are ad hoc and are not part of a coherent strategy. The committee (…) recommends developing a PR strategy for the institute and to encourage its researchers to more structurally engage in outreach activities.

The Institute will develop a PR and outreach strategy. Concrete steps have been taken since 2016 and the new strategy is implemented per early 2018. For this a communication plan is set up, which forms the heart of the PR and outreach strategy. Since many internal approaches in the last years have not led to the expected progress in broad visibility, the institute has engaged with a professional science communication expert who will structurally guide its PR and outreach activities starting from 2018. In its PR and outreach the institute aims to share excellent scientific results such as articles, prizes, fellowships, and grants besides the institute's identity as "one of the very few truly multidisciplinary materials sciences research programmes world-wide". The institute will also implement its own strategy for having its staff structurally involved in outreach activities in a systematic format.
We expect that these steps will lead to substantial media professionalization of the staff, broad news coverage and structural engagement in outreach.

Viability
The funding for the Zernike Institute NRC will be discontinued per 2021, the institute is fully exploring new opportunities for research funding. (…) This may require new, inter-institutional cooperation in order to fit the requirements for this funding scheme, which the institute is already working on. (…) a private donor who is willing to invest many millions into the institute's research on nanomaterials for brain-inspired computers. (…) The committee points out that this funding will likely influence the research focus and structure of the institute and will therefore require a well thought through adapted future research strategy.

The institute keeps scouting for young excellent researchers and maintains its priority to provide an excellent environment to nurture. The institute, in close collaboration with the Faculty Board, has streamlined its hiring procedures and increased its efforts in Talent Development to strategically act in the area of staff development. In this context the director, the management team and the "prize"

committee play an important role to provide an inventory of the qualities in house and support the staff in actively and strategically developing their career.
Via brainstorm days (already held in 2017), the Faculty theme 'Advanced Materials', and actively developing new academic and industrial partnerships the institute explores new research focuses with its entire staff. Besides that, the institute is setting up new collaboration structures with sister institutes. In these activities, the institute focuses on the preparation for new big grants and networks that can lead to them.

Graduate School of Science and Engineering

Duration of PhD-trajectories

Concerning the committee's recommendation *to go for 70% of the PhD students getting their degree within 4 years and not 5 years:* we wish to go gradually and obviously have the audit committee's recommendation as a long-term goal.

Specific measures that are going to be taken are:
- The Faculty Board has asked the Institutes to develop plans how to support supervisors and PhD students to finish the trajectory more timely; as a basis an analysis of obstacles currently seen in completion times was provided by the GSSE. This has led to detailed plans of all institutes, which have been evaluated by the Director of the GSSE. Subsequently, these plans and the Director's evaluation have been discussed in administrative meetings between the Faculty Board and the institutes in fall 2017 and agreements have been reached on the measures to be implemented by each individual institute. The implementation and its effects will be monitored in the following years and discussed during the biannual administrative meetings of the Faculty Board with each institute as well as the administrative meetings with the GSSE.

- The GSSE is currently revising the course *Mastering your PhD*. Main elements are to intensify the mentoring system by scheduling more meetings and to devote more time to project- and time management.

- The Faculty Board has instructed the GSSE to develop a procedure to reward PhD students, who finish their PhD trajectory in time with a bonus.
- The Faculty Board has instructed the GSSE to develop a procedure to establish a Best Supervisor Price at the FSE. The procedure is almost completed and the first ceremony will be scheduled in April.

Many measures have been taken in recent years (coaching, thesis writing, boot camp,...), which were very positively received by the audit committee. Many of them still have to sink in and - due to the 4 years timespan of PhD trajectories - might deploy their full impact only in the coming years.

Role of second supervisor

Concerning the remarks about the role of the second supervisor: we understand the remarks of the audit committee but we are bound by the rules of the University of Groningen.