DESCRIPTION OF TUTORING AND PLACEMENT SERVICES

Considering that SISSA pursues its institutional aims by carrying out basic and applied research through the training of Ph.D students and from the fact that they – the primary output of the School also in terms of "Transfer of Knowledge" to the local territory and to the nation as a whole – will increasingly have to enhance their skills outside the Academy as confirmed by various sources (Ref: Nature Biotechnology volume 31, pages 938–941 - 2013 and more recently Cineca data – papers of the Associazione dottorandi Italiani - May 2019), the School’s "Strategic Plan 2016-2020" sets to take concrete and specific actions to improve the global employability of its doctoral graduates by 360° Talent Valorization.

This strategic choice was also due to the necessity of recognising that the current local, national and European context is characterized by a negative rate of business generation, by a change in the competitive paradigm (also in the so-called emerging countries, like China) that shifts competition from cost to innovation. This creates a consequent need for new and high professionalism to be included in the production context (both goods and services), and a strong interest in accessing innovative and enabling technologies that today represent the beating heart of Innovation and in which SISSA has a forty-year old tradition (i.e. High Performance Computing, Mathematical Modelling, Data Science and Artificial Intelligence). These characteristics, combined with the structuring by the EU and local authorities (e.g. the Region) of very substantial funding programs for networks of research centers and companies (e.g. POR FESR), open up new perspectives which, taken in line with the mission of the School, can create important opportunities for SISSA’s researchers and students.

Inevitably, given SISSA’s uniqueness deriving from its special order, international nature and the almost exclusive focus on third-level advanced training (doctorates), a different approach was chosen - simply because it was considered more functional to the specific context - than those traditionally adopted such as a "Placement Office". SISSA has chosen to experiment with “tailor-made” actions, proposed on the basis of the specific needs of the students (who often participate in the development of the initiatives) and of the innovation needs voiced by local and national manufacturing firms. These pilot projects are mainly supervised by the School’s Technology Transfer Office (TTO) under the direct guidance of the Governing Bodies, Director and Secretary General in particular. The term Technology Transfer in SISSA refers not only to the concept of "Technological Transfer", or "Transfer of Knowledge" where the determining element is not seen in the mere license / transfer of patents or the acquisition of research orders, but also in the ability to systematically transfer capabilities, know-how and problem-solving skills. The hosting companies gain new vision through the eyes of the graduate researchers, and the students and post-docs gain vital experience with the external productive and social world, that represents their potential future employers outside of academia.

The School’s Strategic Plan 2016-2020 foresees the following strategic actions, which will be detailed further on:
- to promote the creation of a collaboration network with the manufacturing system, at regional, national, and international level, that mirrors the scientific network;
- to promote the placement of PhD students outside of academic institutions, taking advantage of the above network to use innovation to satisfy unmet needs;
- to proactively organise and participate in international initiatives for skills promotion (innovation fairs, etc.);
- to implement framework agreements for the creation of a system of representation and enhancement of internal skills, also through the promotion of the UNITY FVG knowledge portal;
- to support the initiatives of SISSA’s community members for the enhancement and promotion of research outcomes (patents, spin-offs, etc.), by providing them with training, financial support and high-quality services;
- to promote the School within the field of continuous and permanent HPC training, science dissemination, and health.

Taking the three-year period from 2016 to 2018 as a reference, the guidelines listed above have been translated into the planning, organisation and implementation of the following initiatives (in some cases highly experimental and innovative for the national scene):

**Promotion of the ‘SISSA Alumni Society’**: in 2018, SISSA worked actively to promote the establishment of a SISSA Alumni Society that had amongst its primary goals that of being an additional resource to promote the training of its students and the careers of its Alumni. To do this it organised mentoring activities and created a network to gather information and create opportunities for them and for the School itself, in terms of attraction of new students, technology transfer and a source of information useful to calibrate future strategic actions. Following the update and completion of the database including the alumni of PhD and postgraduate courses (more than 1900 entries since 1978), existing high-performance models (Scuola Normale di Pisa, Sant’Anna di Pisa, Collegio Ghislieri, University of Padova) were analysed to understand how the School can support the association in the start-up phase and determine its activities, in compliance with the aforementioned objectives. At the same time, a first group of alumni, made up of former students’ representatives on the Board of Directors/Senate/SISSA Club, and alumni-turned-faculty - who had already shown willingness to be part of this initiative, was involved to trigger the bottom-up and top-down process that allowed for the formal establishment of the SISSA Alumni Society in September 2018.

**Annual co-organisation of the ‘JOBFair delle Scuole di eccellenza italiane’**: this event is co-organised together with the other Italian Higher Education Schools (Sant’Anna and Normale of Pisa, the IUSS of Pavia, IMT Alti Studi Lucca, Gran Sasso Science Institute of L’Aquila). It represents a unique opportunity for leading businesses (more than 50 in the past edition) to meet high-potential human resources who, after completing their academic career, enter the labour market and can benefit businesses and the country as a whole. The format is based on one-on-one meetings, managed independently and booked beforehand through the JOBFair portal. The joint goal of the six promoters is to encourage talent and merit with a view to consolidating a virtuous relation
between excellence in training and the world of business, by adopting a ‘talent valorisation’ approach. The purpose of this initiative and of other events aimed at developing human resources is to bring out the distinctive features of those who have trained at a superior graduate school. For example, during the latest edition, 650 individual interviews took place with participants from the six superior graduate schools, with a view to identifying the best candidates for the top business positions available. The attending businesses, represented directly by their human resource managers and directors, included: Acque, Allianz Global Corporate & Specialty SE, Angelini, Angelo Investments, Apparround Italia, Ariston Thermo, AVR, Bonelli Erede, Brembo, Camlin Italy, Chiomenti Studio Legale, Citi, Cleary Gottlieb Steen & Hamilton Llp, Cromology Italia, Edgelab, EidosMedia, Electrolux Professional, Glaxosmithkline, KPMG, IBM Italia, Intesa Sanpaolo, Leonardo, Leroy Merlin Italia, LMCR Studio Legale Associato, Mediobanca, Piaggio & C., Pierburg Pump Technology Italy, RETI - Quicktop, Sixth Sense, Techedge, The European House Ambrosetti, Thales Italia, Tremonti Vitali Romagnoli Piccardi e Associati, UniCredit Business Integrateci Solutions, UnipolSai Assicurazioni, Valagro, Vodafone and VR Media.

Organisation of ‘Not only science’ workshops: a series of workshops (which started in 2017 and became ‘structural’ from the following year) during which former SISSA’s PhD students (2 alumni each session) chat informally to share their experience in pursuing a successful career outside of the academic world and in businesses, start-ups, and in national and international governmental organisations. The purpose of these meetings is to provide an overview of the current (non-academic) labour market and gather recommendations useful to those interested, promoting the networking between doctoral graduates already working in the private sector and PhD students about to enter the labour market.

Organisation of ‘MARS42 – Innovation and Entrepreneurship beyond Academia’ Summer School: organisation of a two-week advanced specialist training course based on the ‘MARS42 Summer Entrepreneurship School’ held in English-speaking countries. This initiative was organised together with The Doers/Accelerator42, a leading Italian enterprise specialised in accelerator programmes for start-ups and spin-offs (characterised mostly by its focus on the promotion and enhancement of ideas/projects relating to the so-called hard science and designed by young researchers/PhD students in scientific disciplines.)

‘PHD4PMI’ pilot project: this project was designed by SISSA in 2018. It aims to connect SMEs with PhD students and young researchers, engaging them in business challenges. The focus is the development of a network of industrial partners, to create new synergies for placements, start-ups and networks for research projects. The goal is to provide local SMEs with a tailored tool to help them seize the opportunities that research can offer and boost their competitiveness, as well as to give young researchers a chance to tackle real business problems, testing SME innovation dynamics, which can be also useful for their future career. The project aims to define a new method for knowledge transfer to:

- connect two players that today rarely meet in the research and innovation market, i.e. SMEs and PhD students/young researchers who are still training, by giving visibility to their potential in terms of added value for SMEs;
- create a network of industrial partnerships which SISSA can draw from when submitting competitive projects.

PHD4PMI is therefore a pilot initiative funded by the School that attempts to converge doctoral training and the innovation needs of SMEs through talent valorisation and technological transfer. This initiative is especially relevant to the local context as small and medium enterprises account for 90% of the Italian manufacturing system. SISSA’s contact channel with the SMEs was the industrial association “Confindustria Venezia Giulia”; local businesses were invited to present their innovation needs to SISSA. Sixteen leading local businesses immediately answered this invitation, submitting 18 innovation challenges to the School. Ten tasks are currently being developed with the involvement of more than 30 PhD students and young researchers. The teams are already devising a Work Plan together with the R&D departments of the businesses involved (Emaze, IrisAcqua, Esteco, ModeFinance, Teorema, BeanTech, Innova, SWG, Grand Hotel Grado and Wartsila.) The single projects last for 2-3 months, after which time the work will be evaluated by the contractor.

Strengths and originality of the project:

- application of science: to raise the awareness of SISSA’s PhD students and young researchers of the benefits of a dialogue with businesses, especially in terms of knowledge and direct testing of real-world innovation dynamics;

- bridging the gap between science and innovation: to test a new kind of ‘laboratory’ where PhD students and SMEs can interact and work together to devise creative solutions for the application of real needs;

- development of partnerships: encouragement of links between the world of research and SMEs, to facilitate placements and talent valorisation dynamics addressed to PhD students and young researchers;

To reach these goals, SISSA directly finances the budget requested by each group to implement their work plan by allocating specific micro-grants. Furthermore, the Technology Transfer Office (TTO) continuously monitors the advancement of the work plans to prevent, where possible, any problems that could compromise the project.

Start-Cup FVG: in 2015 and 2017, SISSA organised ‘Start Cup FVG’ together with the University of Trieste and the University of Udine. This initiative ran a competition for the most original business plans for enterprises and start-ups. It was designed to encourage entrepreneurial projects, promote the establishment and growth of innovative businesses (university/academic spin-offs and start-ups), and more in general promote the enterprise culture in the academic world and in the economic and social context of Friuli-Venezia Giulia.

During the different phases of the event, which generally takes place from April to September, advertising, scouting, training and support activities were carried out to help students and young researchers from SISSA draft their business plans, as well as to liaise with the ILO of the Universities of Trieste and Udine, and with other partners. Since 2015, Start Cup FVG also collaborates with the
regional science parks and professional associations to present a more coordinated offer to the local business market of the possibilities of innovating with scientific research.

**Other minor initiatives:** besides the aforementioned ‘systematic’ activities, in which SISSA invests considerable resources in terms of time, expertise and funds, there is a whole series of minor initiatives, such as (for the sake of brevity, only those carried out in 2018 are included):

- participation in the Job Fair FVG 2018 and in the ALIG conference held in Udine on 24th November, in collaboration with the University of Udine;

- implementation and management of the ‘Higher education and development’ (HEaD) project aimed at supporting business innovation projects by involving post-docs in industrial research activities and in the development of new products;

- organisation of an in-house workshop on technological transfer, held by Professor Andrea Piccaluga, President of NETVAL, with a view to giving PhD students a general overview of the growing importance and processes of knowledge exploitation, both in terms of academic mission and opportunities for career improvement;

- preparation and organisation of two high-level meetings with leading international players (Luxottica and Angelini) to promote talent valorisation and the placement of internal skills;

- participation in the regional event, ‘Smart Health’ on 28th March 2018, which illustrated means of financing available to promote employment and investments in BioHighTech enterprises. The regional project also runs training programmes in the Smart Health sector, for a tailored and effective collaboration between the economic system and scientific entities;

- official partner of “Campus Party 2018”: thanks to this partnership, SISSA’s students and post-docs had free access to the second edition of the biggest international event on innovation and creativity, held in Milan from 18th to 2nd July 2018;

- participation in the “Borsa del Placement Forum” held at the Stazione Marittima in Naples from 6th to the 7th November 2018. This event allowed students and researches to meet HR managers of large companies able to invest in recruiting initiatives.

**Results:** it is estimated that, with reference to the year 2018 only, more than 60 PhD students (out of approximately 300) were proactively involved in tutoring and innovative placement initiatives.

Documents and explanatory texts uploaded in the SUA_Scuole database are available on the Quality page of SISSA website, in the section relative to accreditation: [https://www.sissa.it/cevs](https://www.sissa.it/cevs)