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2023 Pujiang Innovation Forum Bulletin VIII

Supporting young talents to realize high-level sci-tech self-reliance and self-strengthening as leading actors

Editor's Note: At the Symposium for Young Scientists of the Pujiang Innovation Forum 2023, 12 young scientists from different fields conducted in-depth discussions on how young talents should play a more important role in high-level sci-tech self-reliance and self-strengthening, and building China's strength in science and technology responsibly and boldly. This bulletin summarizes views of guests at the Symposium for Young Scientists for your reference.

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The report of the 20th CPC National Congress emphasizes that the strength of a country relies on its youth, and work related to youth should be taken as a strategic priority. Contemporary Chinese young people live in a golden age, and have a vast stage to showcase their competencies and an extremely bright prospect to realize their dreams. Young scientists should forge ahead, and be proactive and leading in building China's strength in science and technology. The young scientists present unanimously proposed that to **realize high-level sci-tech self-reliance and self-strengthening, collaborative efforts are urgently needed in improving the level of scientific and technological innovation talent teams, deepening the reform of scientific and technological systems and mechanisms, and creating a first-class innovation environment.**

I. Enhancing motivation and strengthening the training of young scientific and technological talents

First, promote the growth of young scientific and technological talents. Gao Yawei, Professor at the School of Life Sciences and Technology, Tongji University, said that research projects and talent programs have strict age restrictions, and that if young talents cannot control paces well, they may be unable to obtain sufficient financial support. A more inclusive supporting mechanism for young talents should be established to better assist young talents in the early stage of scientific research and the exploration bottleneck stage in getting through critical

periods. **Lu Chaochao, young scientist at the Pujiang National Laboratory,** said that providing locally trained young talents with the same opportunities and treatment as those for overseas talents is conducive to further retaining top-level local talents.

The second is the supporting mechanism for training basic research talents continually. Shao Yangyang, Research Fellow at the Life Sciences Institute, Zhejiang University, proposed that the key to realizing high-level sci-tech self-reliance and self-strengthening is to create high-level original innovation outcomes. We should focus more on key areas and offer greater support to gather a number of experts and scholars to carry out basic research jointly. **Liu Ying, Associate Dean of the College of Future Technology, Peking University,** proposed that inspirations in basic research are random and need to be verified with corresponding instruments and equipment. However, a certain period is required to apply for the purchase of research instruments, and application approval and fund use management processes suited to basic research requirements should be further established. **Zhu Qigao, Deputy Director of the Science and Technology Commission of Shanghai Municipality,** stated that Shanghai will offer classified support to basic research talents, and for strategically oriented basic research, provide proper support in coordination with the central government; for basic research of free exploration, provide long-term stable support following the scientific and talent growth patterns; and for market-oriented basic research, improve institutional arrangements such as exploration and leadership programs.

Third, keep expanding talent teams for interdisciplinary and

integrated innovation. Fei Peng, Vice Dean of the School of Optical and Electronic Information at Huazhong University of Science and Technology, proposed to pay equal attention to the training of engineering and academic talents, introduce differentiated training options in graduate schooling program and curriculum, and establish different curriculum systems around key research directions to train interdisciplinary and integrated innovation talents more effectively. **Fu Haohuan, Tenured Professor at the Department of Earth System Science, Tsinghua University,** said that focusing on building a national supercomputing application software R&D base and a talent training base with crossover R&D capabilities is the key to sustainable development in the software field.

II. Strengthening driving forces, and deepening the reform of talent systems and mechanisms for scientific and technological innovation

First, explore new organizational models for scientific and technological innovation. Qian Xiaoshi, Professor at the State Key Laboratory of Mechanical System and Vibration, Shanghai Jiao Tong University, stated that currently, technological breakthroughs require a stronger research organization model, where a centralized mechanism for scientists linked up by major infrastructure may be explored to realize breakthroughs in core technologies through closer collaboration and normalized exchanges. **Feng Han, Senior Engineer at the Central Iron & Steel Research Institute,** said that for "strangleholds" with clear requirements, we should apply an enterprise-centric approach, and guide stakeholders in the entire chain to establish coalitions for collaborative

innovation. For research in maiden fields, we can draw on the DARPA model in the U.S., and stick to the strategic layout of developing one generation and reserving the next generation. **Xu Shu, Director of the Advanced Algorithm Laboratory, Hikvision Research Institute,** stated that young talents should be trusted with more significant tasks practically, because they are good at breaking away from conventions, and adapting to changes in research methods and innovation paradigms.

Second, deepen the reform of scientific research management systems. Jia Sisi, Research Fellow at the Zhangjiang National Laboratory, said that for purposes of the laboratory's confidentiality management, researchers are not well aware of the organization's development goals, and there is limited collaboration among teams, so a two-way interaction mechanism between talents and the platform should be established as soon as possible. **Shen Feixiang, Research Fellow at Shanghai Marine Diesel Engine Research Institute,** proposed that for major scientific research projects and technological achievements independently carried out by enterprises, a channel for ascending to state-level scientific research projects should be available when certain national strategic requirements are met. In terms of the incentive reform of state-owned enterprises, further break through payroll restrictions on them, and implement incentive and reward policies for technological innovation and achievement transformation effectively. **Fei Peng** proposed to break interdisciplinary barriers through reforms in the sorting of paper titles, ownership of achievements and university enrollment indicators.

Third, improve the classified evaluation mechanism for scientific and technological talents. Gao Yawei stated that contribution levels of

scientific research achievements should not be based solely on author rankings; instead, classified talent evaluation should be further improved, and a more refined indicator system established to further suit different types of talents. **Qian Xiaoshi** proposed that for industrialization talents concerning basic research fields, their innovation abilities cannot be measured solely by papers, and more individualized evaluation criteria should be tailored. **Fu Haohuan** said that in addition to focusing on top-level talents, it is also necessary to strengthen the evaluation and motivation of core talents in order to retain all kinds of supportive talents more effectively.

Fourth, establish a two-way fast lane between R&D and industrialization. Xu Shu proposed that guided by national demand, enterprises should sum up industrial development requirements, and scientists and enterprise R&D personnel should participate together to further align technological innovation achievements with industries. Qian Xiaoshi said that basic issues should be summed up from engineering application scenarios to promote breakthroughs in basic research innovation in the reverse direction. **Fei Peng** stated that there are still many gaps in the ramp-up stage of small and pilot trials, and the further industrialization of early-stage R&D achievements can be supported by establishing university industrialization funds and professional market-oriented teams, and offering university-enterprise joint support. W**ang Shiquan, Founder of Shanghai Flexiv Robotics Technology Co., Ltd.,** suggested that enterprise researchers should have more opportunities to pursue part-time doctoral studies, thereby involving enterprises in frontline scientific research.

III. Offering stable support, and optimizing the soft environment for the development of technological innovation talents

First, establish an information exchange resource matchmaking platform. **Qian Xiaoshi** said that establishing a normalized dialogue platform between researchers and government agencies is conducive to the timely communication between researchers and policymakers. **Liu Ying** stated that a data sharing center should be established at the national level to facilitate scientists' access to data resources and help them generate high-quality achievements. **Wang Shiquan** proposed that we can draw on the model of the Transformation Center at Stanford University to further help scientists extend innovation achievements and match industry applications through professional achievement transformation platforms and talent teams.

Second, improve the scientific literacy of young talents. Liu Ying pointed out that currently, college students generally lack the courage to challenge authority, and graduate students' interest in scientific research is weakening. We should pay more attention to the development of the spirit of science, innovation capacity and critical thinking, strengthen STEM education, and involve more scientists in science popularization at primary and secondary schools to motivate students to pursue scientific research. **Gao Yawei** proposed to increase opportunities of contact between researchers and students, arouse students' interest in technological innovation through interactions between teachers and students, and disseminate scientific ideas more effectively. **Lu Chaochao** suggested that universities should establish rapid response mechanisms to suit the rapid iteration of scientific development, update the curriculum

training system timely, and enhance students' professional competencies in frontier fields.

Third, optimize the sociocultural environment to make it open and inclusive. Gao Yawei stated that scientific research relies on a supportive environment, and to realize high-level sci-tech self-reliance and self-strengthening, and build a sound capability system, we should pay more attention to opening-up and cooperation, and master international frontier research developments timely. **Feng Han** suggested that it is crucial to create a research environment that fosters innovation and tolerates failures, encourage scientists to venture into maiden fields, and do well in the R&D and reservation of non-consensual projects.

Compiled by: Wu Yuting, Luo Xianfeng