

Ministry of Education
Yushan Fellow Program
Annual Performance Report

University Name and Appointment Unit : National Tsing Hua University Institute of Astronomy	Academic Field : Science
Name of the Administration Support Grant Fellow : 何英宏 Daniel Harsono	Administration Support Grant Fellow
Reporting Year : 2021 (1st year)	

Yushan Fellow Program

Performance Report

Assessment of effectiveness of tangible work (The implementation results can be presented cumulatively, including the annual performance report of the second year, which can include the results of the first year and the second year)

Main points of assessment	The anticipated goals	Concrete work achievements or results	Supporting documents
1. Chief content of the Fellows' research work and overview of full research process.	Dr. Harsono will develop an interdisciplinary research group that dwells into the origin of the Solar System and astrobiology. He will combine both observational and theoretical astrophysics in studying the formation of planetary systems. He utilizes the state-of-the-art telescopes such as ALMA, JWST (James Webb Space Telescope), and facilities in the European Southern Observatories to provide the leading-edge data in star and planet formation.	<ul style="list-style-type: none"> ● PI of one JWST program ● Co-I on four general observing programs on star and planet formation ● \$80+k NASA funding for the approved program to be handled by University of Virginia ● 6+ publications in the first year including 1 nature ● ALMA large program on complex organics 	Appendix No.
2. The link between Fellows' future research topics and the university's development and the anticipated benefits (including Higher Education SPROUT Project): (1)Fellows' research plan and goals (2)The link between scholars' research content and the university's development (3)Specific work performance or achievements, please include the	<p>1. Research plans and goals</p> <p>Dr. Harsono will continue his research on planet and star formation, and he will further explore new areas and collaborate with other researchers here in NTHU. Dr. Harsono has strong connections with research teams in Europe, East Asia and North America and is a member of a few ALMA programs. He can naturally join and take parts in the Taiwan academic environments as well as leads important</p>	<p>In the past year, I have attempted to build a group to continue working on star and planet formation. With my collaborators in US, EU, and Asia (Japan and Korea):</p> <ul style="list-style-type: none"> ● 1 Nature paper published ● 1 Nature paper in review ● 1 Science paper in review ● Total of 6 publications since August 1 2021 (start of the hiring) 	Appendix 1

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<p>mid-term progress report of the particular research plan</p> <p>(4) Anticipated goals (including qualitative or quantitative working performance or results)</p> <p>※ If there is a quantitative work achievements, please fill out "Quantitative Assessment Form"</p>	<p>large research projects in the near future. His short-term research interests lie in using numerical models to interpret the observational results for understanding physical and chemical complexity in the early protoplanetary disks. Furthermore, Dr. Harsono has creative ideas that can convert to good research topics for young students. He can help students learn relevant and important knowledge in planet and star formation.</p> <p>2. The link between scholars' research content and the university's development</p> <p>Dr. Harsono plans to advance his numerical models for planet and star formation by studying gas, dust, and ice compositions with multi-wavelength approaches. He will investigate the origin of the diversity in the planetary systems, and their connections to physical and chemical complexity of protoplanetary disks.</p> <p>Dr. Harsono conducts studies combining numerical and observational astrophysics. His model can follow the chemical evolution of the systems for comparison with observational data. Such specializations are closely related to works by Dr. Huei-Ru Chen, Dr. Shih-Ping Lai, and Dr. Ing-Guey Jiang here in Institute of Astronomy, NTHU. We</p>	<ul style="list-style-type: none"> • The approval of JWST program, NASA budget to support that program (80k USD) • 4 JWST observing programs in total in addition to participations in early release science of JWST, GTO program on JWST and other affiliated programs • The approval of ALMA program to study complex organics in the next 2 years (large program > 100 hours) • Approval of NSTC grant ICOENICs to support for more students and RA • Hired 2 RA to help with administration and research into machine learning with GPUs • One bachelor student at NTHU to work on database mining • Three summer students from NCTS and ALMA programs: 1 student from Taiwan, 1 student from NL and 1 student from India • One high school student that was mentored in collaboration with Dr. Naomi Hirano was accepted into Stanford • High school student applied to MIT, Caltech and Stanford. Withdrew from UC Berkeley. A successful mentoring of high school student. 	

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	<p>expect a rich productivity in a short term. In addition, his numerical approaches will bring new aspects and interests to our colleagues in Department of Physics.</p> <p>3. Anticipated goals (including qualitative or quantitative working performance or results)</p> <p>In addition to a good publication rate, Dr. Harsono can also share his experiences in data analysis and relevant knowledge. In a near future, he plans to expand his numerical models for the diversity of planetary systems and links to physical and chemical complexity in protoplanetary systems. Based on his recent publication rate, he is capable of publishing 1~2 leading author papers every year. He will also present his results in international conferences and advice graduate students for research about young exoplanets.</p>	<ul style="list-style-type: none"> • Participate in a few graduate student's thesis committee • One paper to be submitted on the observations of planet formation around low-mass stars (PI) • Another paper to be submitted as PI on water in young stars. 	
3. Support provided by the university and the project's original goals (please specify the type of support or funds provided by the university to assist in research, such as research equipment and funds, research	<p>1. National Tsing Hua University Newly-Recruited Faculty Academic Research Subsidy (start-up subsidy)</p> <p>NTHU provides the Academic Research Subsidy (start-up subsidy) to help the</p>		

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assistant personnel expenses, accommodation, relocation, children's education assistance, etc.)	<p>newly-recruited faculties build up their research labs and facilities, and encourage them concentrate on research. Within six months after reporting, the newly-recruited faculties can apply for the subsidy. After approval, in principle every applicant can obtain NTD\$ 1.5 million at most provided together by department, college and university.</p> <p>2. Guest House and accommodation subsidy</p> <p>i. Guest House In principle the newly-recruited faculties have the priority to apply to live in Guest House III, single room or double room. Besides, the newly-recruited faculties also can apply to live in Guest House I or Guest House II. Further information please refer to http://ddfm.site.nthu.edu.tw/p/412-1494-18019.php?Lang=zh-tw 、 http://ddfm.site.nthu.edu.tw/p/412-1494-16435.php?Lang=zh-tw.</p> <p>ii. Accommodation subsidy If it conforms to the regulation of the accommodation subsidy in NTHU, the newly-recruited full-time faculties</p>	<p>A subsidy was obtained from NTHU to decorate the office and acquire new computing facilities to assist with the research.</p> <p>Accommodation was provided along with a subsidy for the first 3 years.</p>	

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	<p>have the option to apply for the accommodation subsidy (up to NTD\$10,000 per month) for a duration of three years.</p> <p>4. Education of children</p> <p>i. Children of the newly-recruited full-time faculties have the priority to apply to study in the Affiliated Kindergarten or Affiliated Experimental Elementary School of National Tsing Hua University.</p> <p>ii. Children of faculties in NTHU are eligible for admission to apply to study in the Junior high school Department 、 Elementary Department, or Kindergarten Department in National Experimental High School at Hsinchu Science Park.</p> <p>iii. Children's education subsidy : Further information please refer to http://person.site.nthu.edu.tw/p/406-1066-12001,r940.php?Lang=zh-tw.</p> <p>5. Other Employee Benefits</p> <p>i. Birthday vouchers : Every full-time faculty member will receive the birthday vouchers every year.</p>		

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	<ul style="list-style-type: none"> ii. Health-check subsidy : Every full-time faculty member over 40-year-old can apply for the health-check subsidy once every two years. iii. Group insurance at one's own expense iv. Deposits at preferential interest v. Using sports complexes and equipment at a preferential price <p>6. Teaching Resources Support</p> <ul style="list-style-type: none"> i. Orientation for Incoming Faculty : A two-day orientation for new faculty members is held annually during the first week of September at NTHU. ii. Faculty Workshop : A series of workshops are offered to further improve the education quality at NTHU. iii. Funding for Teachers' Community : Funding for Teachers' Community is provided to enhance and activate teachers interflow and cooperation. iv. Individual Teaching Improvement through Consultation and Videotaping : Courses are videotaped and 		

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	<p>reviewed by experienced expert teachers in the same academic field who also give feedback on the applicants teaching.</p> <p>v. Curriculum and Teaching Innovation Mini- Project : Funding is available to facilitate the creation of innovative curriculum.</p>		

Quantitative Assessment Form

Item		Results and concrete work performance	Explanation
1. Manpower training		Doctoral courses: __0__ Graduate courses: __1__ Undergraduate courses: __1__ Doctoral students: 0 persons Master's students: 0 persons Undergraduate students: 1 persons Others: 4 persons	For the first year, two courses are needed to satisfy the requirement. Directly training students at NTHU is 1 BSc student and 1 RA (research).
2. Papers and research works	Domestic	Journal papers: _____ Academic books and papers in books: _____ Conference papers: _____ Technical reports: _____ Others: _____	
	Overseas	Journal papers: 11 Academic books and papers in books: 1 Conference papers: _____ Technical reports: _____ Others: _____	11 Journal papers with international collaborators published in international journal. 1 Review chapter in a book.
3. Keynote speaker		2 panels /sessions	1 Domestic and 1 international
4. Patents (including patents pending)	Domestic	Quantity: _____	
	Overseas	Quantity: _____	
	■ N/A		
5. Industry-Academia Cooperation		Number of partnered enterprises : _____	NaN
		Number of industry-academia research projects: _____	
6. Technology licensing		Technology licensing cases: _____	
		Total technology licensing royalties (amount) NT\$ _____	
		■ N/A	
7. Others		1 Press release on the nature paper and 1 interview by news channel (Public outreach).	