Results of Applications for the 2017 Sustainability Science Research Projects at Academia Sinica Announced

There is a total of 11 applications for the 2017 Sustainability Science Projects (5 from the Area of Energy and Decarbonization Technologies; 3 from the Area of Food Security; 1 from the Area of Environmental Change and Human Well-being; 1 from the area of Ecological Conservation and Sustainable Use of Biodiversity Resources; 1 from the Area of Human-dimensions of Sustainable Development). The applications require a budget of NT$ 137,661,000 in total (NT$ 67,983,000 for the Area of Energy and Decarbonization Technologies; NT$ 32,930,000 for the Area of Food Security; NT$ 19,955,000 for the Area of Environmental Change and Human Well-being; NT$ 6,793,000 for the Area of Ecological Conservation and Sustainable Use of Biodiversity Resources; NT$ 10,000,000 for the Area of Human-dimensions of Sustainable Development).

Of all the applications, 5 were approved in the meetings of the Second-round Review and Budget Review, including 2 from the Area of Energy and Decarbonization Technologies, 2 from the Area of Food Security and 1 from the Area of Ecological Conservation and Sustainable Use of Biodiversity Resources. The total approved budget amount is NT$ 55,700,000 (NT$ 29,500,000 for the Area of Energy and Decarbonization Technologies; NT$ 19,500,000 for the Area of Food Security; and NT$ 6,700,000 for the Area of Ecological Conservation and Sustainable Use of Biodiversity Resources). Please refer to the following table for detailed information. Approved projects may not be executed until the budget plans are passed.

A. Area of Energy and Decarbonization Technologies: (2 projects)

Project No.	Title of Projects	(1) Principal Director (2) Subproject PI (3) Co-PI	Institutions
AS-106-SS-A01	Development of Novel Thermoelectric Materials for Sustainable Energy	(1) Kuei-Hsien Chen	IAMS, Academia Sinica
	A01-1 New high performance thermoelectric materials: Layer structured SnSe crystal, Aerogel-added composites, and cage-like structures	(2) Yang-Yuen Chen (3) Raman Sankar	IoP, Academia Sinica
	A01-2 Effects of Interfacial and Nonlocal Thermal Conduction to Thermoelectricity	(1) Chih-Wei Chang	Center for Condensed Matter Sciences, NTU
	A01-3 Development of Thin Film and Low-cost Thermoelectric Materials	(2) Kuei-Hsien Chen (3) Fang-Cheng Chou	IAMS, Academia Sinica Center for Condensed Matter Sciences, NTU

	A01-4 First-Principles Calculations of the Physical Properties of Thermoelectric Materials	(2) Mei-Ying Chou (3) Chin-Ming Wei	IAMS, Academia Sinica
AS-106-SS-A02	Development of next-generation sustainable photovoltaic energy	(1) Chin-Ti Chen (3) Juen-Kai Wang	IoC, Academia Sinica IAMS, Academia Sinica
	A02-1 Frontier polymer solar cells from shear-induced crystallization process of crystallizable photoactive-layer materials	(2) Chin-Ti Chen (3) Leeyih Wang (3) Ping-Tsung Huang	IoC, Academia Sinica Center for Condensed Matter Sciences, NTU Dep. of Chemistry, FJU
	A02-2 Perovskite-based Photovoltaics Harnessing New Hole- and Electron-Transporting Materials for Light-Harvesting under 1 Sun and Dim Light Conditions	(2) Ken-Tsung Wong (3) Chih Wei Chu (3) Hao-Wu Lin	Dep. of Chemistry, NTU RCAS, Academia Sinica Dep. of Materials Science & Engineering, NTHU
	A02-3 Facile production of non-toxic and earth-abundant metal chalcogenides for next-generation solar cells	(2) Li-Chyong Chen	Center for Condensed Matter Sciences, NTU
	A02-4 Multiscale Molecular Simulations of Morphologies of Organic and Organic-Inorganic Hybrid Solar Cells	(2) Juen-Kai Wang	IAMS, Academia Sinica
	A02-5 Establishment and evaluation of fabrication technique of large-area, vacuum-free and solution-processed OPV devices with potential of commercial modules	(2) Cheng-Si Tsao (3) Yu-Ching Huang (3) Hou-Chin Cha (3) Charn-Ying Chen	INER, Atomic Energy Council, Executive Yuan

B. Area of Food Security: (2 projects)

Project No.	Title of Projects	(1) Principal Director (2) Subproject PI (3) Co-PI	Institutions
AS-106-SS-A03	Effects of environmental changes on rice growth and production in Taiwan	(1) Ming-Che Shih	ABRC, Academia Sinica
	A03-1 Development of strategies to control the rice sheath blight disease caused by the fugal pathogen *Rhizoctonia solani*	(2) Ming-Che Shih	ABRC, Academia Sinica

	A03-2 Evaluating the effect of heat tolerance related transgenes on rice thermotolerance phenotypes	(2) Yee-Yung Charng (3) Ching-Hui Yeh	ABRC, Academia Sinica Dep. of Life Sciences, NCU
	A03-3 Exploration of phosphate transport system to improve phosphorus use efficiency in rice	(2) Tzyy-Jen Chiou (3) Swee-Suak Ko	ABRC, Academia Sinica AS-BCST, ABRC, Academia Sinica
	A03-4 Functional analysis and molecular breeding of nitrogen-responsive transcription factor genes in rice	(2) Ming-Hsiun Hsieh	IPMB, Academia Sinica
	A03-5 Biofortification of zinc and iron micronutrients in rice	(2) Kuo-Chen Yeh	ABRC, Academia Sinica
	A03-6 Generation of rice cultivars with improved nitrogen utilization efficiency	(2) Yi-Fang Tsay	IMB, Academia Sinica
AS-106-SS-A04	Research and development of bird flu vaccines against highly pathogenic avian influenza virus	(1) Shu-Mei Liang (3) Pei-Wen Hsiao	ABRC, Academia Sinica
	A04-1 Production of H5 virus-like particle vaccine in insect stable cell line carrying modification of mono-glycosylation or complex N-glycans	(2) Pei-Wen Hsiao (3) Ming-Shyue Lee	ABRC, Academia Sinica Graduate Institute of Biochemistry and Molecular Biology, CMNTU
	A04-2 The development of virus-like particle vaccine against novel and old avian influenza viruses in Taiwan simultaneously	(2) Lih-Chiann Wang	School of Veterinary Medicine, NTU
	A04-3 Development of effective and affordable vaccine adjuvant against highly pathogenic avian influenza virus	(2) Shu-Mei Liang	ABRC, Academia Sinica
	A04-4 Study of innate immune responses to adjuvanted vaccines in avian hosts and development of immunoassays to differentiate infected from vaccinated animals	(2) Chia-Chi Ku	Institute of Immunology, NTU

	A04-5 Study the protective efficacy of new developed and traditional vaccines against highly pathogenic avian influenza virus.	(2) Ming-Chu Cheng	Dep. Epidemiology Research, AHRI, COA, Executive Yuan

C. Area of Ecological Conservation and Sustainable Use of Biodiversity Resources: (1 project)

Project No.	Title of Projects	(1) Principal Director (2) Subproject PI (3) Co-PI	Institutions
AS-106-SS-A05	Biological impacts of climate change on mountain regions: An integrative study	(1) Mao-Ning Tuanmu	BRC, Academia Sinica
	A05-1 Climate change in global mountain regions: simulation modeling and empirical validation.	(2) Po-Hsiung Lin (3) Yao-Hua Ho	Dep. Atmospheric Science, NTU Dep. of Computer Science and Information Engineering, NTNU
	A05-2 Climatic variability, biotic interaction, elevational range size, and range limits of burying beetles	(2) Sheng-Feng Shen	BRC, Academia Sinica
	A05-3 Reunification of climatic variability, species thermal trait and range size across wide geographic gradients: a macrophysiological perspective.	(2) I-Ching Chen	Dep. of Life Science, NCKU
	A05-4 Patterns and drivers of intraspecific trait variation within ecological communities along elevational gradients: implications for climate change impacts	(2) Mao-Ning Tuanmu (3) I-Ching Chen	BRC, Academia Sinica Dep. of Life Science, NCKU