

MHEP experiment group meeting

2026-08-18

1. Equipment budget TWD 10.4 M
returned to IPAS ~October
2. Operation budget TWD 3M
personal traveling 150k ~September
personal operation 100k
MHEP share 200k/person
3. AAC introduction due September
introduction page, revision

MHEP 2026 operation budget

人員：	8 persons
AMS 強場 Axion:	張元翰 林志勳
ATLAS:	侯書雲 王嵩銘 楊毅
Gravity:	Haino 王子敬
Nuclear:	章文箴
Tier:	嚴漢偉 independent funding, exclude from MHEP budget

經費：

IPAS personal operation per IP TWD 120k traveling, TWD 100k operation

MHEP group operation : **TWD 3.125 M**

1. MHEP 2026:

MingLi Zhu 0.348 MNT/yr,	to be reviewed for 2027
Lu Yun-Ju 0.73 MNT/yr,	to be reviewed for 2027
Peirong Tsai 0.348 MNT/4mon	released after 05/01 to NSTC ATLSA P2

2. MHEP group, TWD 0.2M/person share

08/04 0.67M remains (lowest priority)

章文箴 林志勳 王子敬 楊毅 張元翰 侯書雲 王嵩銘 嚴漢偉

Equipment, 2026 (115年)

approved 10.4 M × 0.94 = **9.78 M** TWD

5.5 M TWD released to IPAS
swap/lent to other groups (Bio 1.5M,QMP 4 M)
Bio is quiet
Quantum may want a large amount

Spent		reserved	
W.C. Chang	1.01 M	Y.H Chang	1.3 M to W.L.Lee
C.H. Lin	0.52 M	Y. Yang	0.42M
S. Haino	0.89 M	H.T. Wong	1.0 M
		WG HPC	1.0 M

Group plan

	2022	2023	2024	2025	2026
ATLAS/STAR	0.0	0.0	4.0	4.0 (1.5+0.765+0.7)	5.0
TEXONO/LIGO	2.0	2.0	1.5	1.5 (1.5)	2.0
KAGRA	0.5	0.5	2.0	0.5 (0.56)	0.5
TASEH	1.65	2.5	1.0	0.5(0)	1.0
Hadron	1.5	1.0	1.0	1.0 (0.56)	1.0
Instrumentation	0.5	0.5	0.5	0.5 (0.47)	0.5
Computing (GW)	1.13	3.5	1.0	0.5 (0)	1.0
Sum	7.28	10.0	11.0	8.5 (5.5)	12.0

2026 approved

張元翰	搜尋低質量暗物質與軸子實驗，4-5GHz頻段微波放大器及微波信號讀出元件。低溫環境磁場隔絕設備 (magnetic shielding) —	1,300,000
王嵩銘	探測器訊號處理精密電子與數據擷取儀器	1,300,000
	新進研究人員實驗室開辦所購之儀器、設備及各實驗室小型儀器 (以下各項合計)	3,400,000
灰野禎一	重力波實驗雷射儀器系統	0
王子敬	重力實驗光學系統儀器與配件	0
王子敬	訊號處理精密電子與數據擷取儀器	0
王子敬	微中子探測器昇級	0
章文箴	高壓模組	0
章文箴	可編程邏輯晶片系統元件	0
王嵩銘	GPU 計算處理器	1,000,000
侯書雲	ATLAS Phase-II升級製做，與CEPC碰撞束流 LumiCal探測器製做之電子讀出設備	2,400,000
楊毅	ATLAS大型環境烤箱與數據截取系統	1,000,000
	合計	10,400,000

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TWD (M)	2022	2023	2024	2025	2026	2027
				Plan/spent	Pl/App/spt	
ATLAS	0	0	4.0	4.0/2.96	5.0/2.4/0	
STAR/ePIC	0	0	0	0	0/1.0/0.42	
TEXENO	2.0	2.0	1.5	1.5/1.5	2.0/0/1.0	
KAGRA	0.5	0.5	2.0	0.5/0.56	0.5/1.0/0.89	
TASEH	1.65	2.5	1.0	0.5/0	1.0/1.3/0	
Hadron	1.5	1.0	1.0	1.0/0.56	1.0/0/1.01	
Instrum	0.5	0.5	0.5	0.5/0.47	0.5/1.3/0.52	
Computing	1.13	3.5	1.0	0.5/0	1.0/1.0/1.0	
IoP budget	7.28	10.0	11.0	8.5/6.05	11/9.8/~3	

Equipment, 2026 (115)
approved 10.4 M TWD

5.5 M TWD released to IPAS
swap/lent to other groups (Bio 1.5M, Nano 4 M)

Near 4.9 M available
KAGRA reserved 0.5 M

Hold till Jul 31, will be release to IPAS

Request and Proposal of Equipment Fund
(as July 24th): Total amount (Spent amount)

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Proposed

115年度 機械設備概算表(尚未通過立院)				(單位：新台幣元)	
張元翰	搜尋低質量暗物質與軸子實驗，4-5GHz頻段微波放大器及微波信號讀出元件。低溫環境磁場隔絕設備 (magnetic shielding)。	1	1,500,000	1,500,000	升級設備將從現有的2-3GHz頻段提高至4-5GHz頻段，軸子質量提高至2-2.5微電子伏
王嵩銘	探測器訊號處理精密電子與數據擷取儀器	1	1,500,000	1,500,000	高能組實驗室共用之基礎研究設施建構、維護及更新
灰野禎一	重力波實驗雷射儀器系統	1	500,000	500,000	重力波實驗—刻度探測器計畫之用
王子敬	重力實驗光學系統儀器與配件	3	300,000	900,000	降低重力實驗之溫度，提供低溫之環境
王子敬	訊號處理精密電子與數據擷取儀器	2	300,000	600,000	用於重力實驗之數據擷取
王子敬	微中子探測器昇級	1	500,000	500,000	增強微中子探測器
章文箴	高壓模組	1	500,000	500,000	提供矽探測器和氣體探測器使用
章文箴	可編程邏輯晶片系統元件	2	250,000	500,000	用於探測器讀出電子元件之維護、研發
王嵩銘	GPU 計算處理器	4	250,000	1,000,000	配合 AMS, 重力波, 微中子等粒子物理研究需求, 擴充高效能 GPU 計算資源, 以不低於NVIDIA L40S GPU 卡計算效能設備為標的。
侯書雲	ATLAS Phase-II升級製做，與CEPC碰撞束流LumiCal探測器製做之電子讀出設備	1	3,500,000	3,500,000	提供LumiCal原型材料及開發器械之設備
楊毅	大型環境烤箱與數據截取系統	1	1,000,000	1,000,000	ATLAS實驗中探測器機械結構的熱傳導測試與Prototype的性能測試設備
申請總額				12,000,000	

approved

張元翰	搜尋低質量暗物質與軸子實驗，4-5GHz頻段微波放大器及微波信號讀出元件。低溫環境磁場隔絕設備 (magnetic shielding) —	1,300,000
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灰野禎一	重力波實驗雷射儀器系統	0
王子敬	重力實驗光學系統儀器與配件	0
王子敬	訊號處理精密電子與數據擷取儀器	0
王子敬	微中子探測器昇級	0
章文箴	高壓模組	0
章文箴	可編程邏輯晶片系統元件	0
王嵩銘	GPU 計算處理器	1,000,000
侯書雲	ATLAS Phase-II升級製做，與CEPC碰撞束流LumiCal探測器製做之電子讀出設備	2,400,000
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MHEP introduction to AAC 2026

MHEP-exp Group Report for the 2025 AAC Meeting

• Research summary/highlights (2020-2025)

- J.D. Brandenburg et al., “The STAR Forward Silicon Tracker”, [Nucl. Instrum. Methods A 1072, 170202 \(2025\)](#).

Yi Yang is the deputy project manager for the STAR Forward Silicon Tracker (FST) project and the principal investigator for mechanical structure for STAR FST R&D and production, and one of the main authors of the paper.

- ATLAS Collaboration, “Combination of Searches for Higgs Boson Pair Production in pp Collisions at $\sqrt{s}=13$ TeV with the ATLAS Detector”, [Phys. Rev. Lett. 133, 101801 \(2024\)](#).

The $b\bar{b} \rightarrow b\bar{b}$ results which were published in Phys. Rev. D 110 (2024) 032012 and contributed greatly by the AS group, is included in this combination. The $b\bar{b} \rightarrow b\bar{b}$ results have the best single channel expected limit on the Higgs boson pair production cross section in the ATLAS experiment.

- M.G. Alexeev et al. (COMPASS Collaboration), “Final COMPASS Results on the Transverse-Spin-Dependent Azimuthal Asymmetries in the Pion-Induced Drell-Yan Process”, [Phys. Rev. Lett. 133, 071902 \(2024\)](#).

The combined results of the 2015 and 2018 Drell-Yan runs support the QCD-predicted sign change for the Sivers functions. The AS group has been involved and contributed significantly to the success of this measurement in terms of instrumentation, data taking, and data analysis.

- S. Karmakar et al. (TEXONO Collaboration), “New Limits on Coherent Neutrino Nucleus Elastic Scattering Cross Section at the Kuo-Sheng Reactor Neutrino Laboratory”, [Phys. Rev. Lett. 134, 121802 \(2025\)](#).

This work reported the most sensitive results at the time of publication on the pursuit of neutrino coherent scattering with the nucleus with reactor neutrinos.

- M. Aguilar et al. (AMS Collaboration), “Antiprotons and Elementary Particles over a Solar Cycle: Results from the Alpha Magnetic Spectrometer”, [Phys. Rev. Lett. 134, 051002 \(2025\)](#). (Editor’s suggestion, Featured in Physics, Physics viewpoint)

The AS group is one of the two parallel groups working on antiproton, and it took us ~4 years to complete the work.

- A. G. Abac et al. (LVK Collaborations), “Ultralight vector dark matter search using data from the KAGRA O3GK run”, [Phys. Rev. D 110, 042001 \(2024\)](#).

We searched for ultralight vector dark matter by laser interferometric gravitational wave detectors through the measurement of oscillating length changes in the arm cavities. KAGRA has a unique feature due to the differing compositions of its mirrors, enhancing the signal in the length change.

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Equipment, 2027 (116) submitted

	A	B	C	D	E	F
1	116年度 機械設備概算表			(單位：新台幣元)		
2	張元翰	搜尋低質量暗物質與軸子實驗，頻譜分析儀讀出元件及超低溫環境機械設備。	1	1,500,000	1,500,000	升級設備提，供測量讀出系統，真空及低溫實驗環境控制。
3	王崙銘	ATLAS 升級探測器訊號處理電子設備與數據庫存取設備	1	1,500,000	1,500,000	高能組實驗室共用之基礎研究設施建構、維護及更新
4	灰野禎一	重力波實驗雷射儀器系統	1	1,000,000	1,000,000	重力波實驗—刻度探測器計畫之用
5	王子敬	重力實驗光學系統，訊號處理精密電子與數據擷取儀器	1	1,000,000	1,000,000	重力實驗之數據擷取，及實驗室之低溫環境
6	王子敬	微中子探測器昇級	1	500,000	500,000	增強微中子探測器
7	章文箴	可編程邏輯晶片電子開發系統及探測器高壓系統	1	1,500,000	1,500,000	矽探測器和氣體探測器的供電系統及 讀出電子元件之研發
8	王崙銘	網格 CPU及GPU 計算處理器	1	2,000,000	2,000,000	配合物理研究需求,擴充高效能 GPU 計算資源設備
9	侯書雲	ATLAS升級與CEPC碰撞束流LumiCal探測器研發電子讀出設備	1	1,500,000	1,500,000	提供LumiCal原型材料及開發器械之設備
10	楊毅	EIC 探測器研發數據截取系統	1	1,500,000	1,500,000	探測器測試與Prototype的性能測試設備
11	申請總額				12,000,000	
12						
13						
14	115年度 機械設備概算表(尚未通過立院)			(單位：新台幣元)		
15	張元翰	搜尋低質量暗物質與軸子實驗，4-5GHz頻段微波放大器及微波信號讀出元件。低溫環境磁場隔絕設備 (magnetic	1	1,500,000	1,500,000	升級設備將從現有的2-3GHz頻段提高至4-5GHz頻段，軸子質量提高至2-2.5微電子伏
16	王崙銘	探測器訊號處理精密電子與數據擷取儀器	1	1,500,000	1,500,000	高能組實驗室共用之基礎研究設施建構、維護及更新
17	灰野禎一	重力波實驗雷射儀器系統	1	500,000	500,000	重力波實驗—刻度探測器計畫之用
18	王子敬	重力實驗光學系統儀器與配件	3	300,000	900,000	降低重力實驗之溫度，提供低溫之環境
19	王子敬	訊號處理精密電子與數據擷取儀器	2	300,000	600,000	用於重力實驗之數據擷取
20	王子敬	微中子探測器昇級	1	500,000	500,000	增強微中子探測器
21	章文箴	高壓模組	1	500,000	500,000	提供矽探測器和氣體探測器使用
22	章文箴	可編程邏輯晶片系統元件	2	250,000	500,000	用於探測器讀出電子元件之維護、研發
23	王崙銘	GPU 計算處理器	4	250,000	1,000,000	配合 AMS, 重力波,微中子等粒子物理研究需求,擴充高效能 GPU 計算資源,以不低於NVIDIA L40S GPU 卡計算效能設備為標的。
24	侯書雲	ATLAS Phase-II升級製做，與CEPC碰撞束流LumiCal探測器製做之電子讀出設備	1	3,500,000	3,500,000	提供LumiCal原型材料及開發器械之設備
25	楊毅	大型環境烤箱與數據截取系統	1	1,000,000	1,000,000	ATLAS實驗中探測器機械結構的熱傳導測試與Prototype的性能測試設備
26	申請總額				12,000,000	