

# 2020 Online Physics Olympiad (OPhO): Open Contest Score Report



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## 1 OPhO Open Contest Scoring Algorithm

The base score for each problem is dependent on the difficulty which in turn is decided by the number of people who successfully answered it. Each incorrect attempt will decrease the base score and teams will be awarded bonus points for correctly solving it quickly.

The scoring mechanism is heavily based off of the one used at HMMT (Harvard-MIT Mathematics Tourney):

$$w(n, N) = (0.9)^{i+j} [\exp(n/40) + \max(5.5 - \lfloor \ln N \rfloor, 2)],$$

where  $i \in \{0, 1, 2\}$  (represents whether a team got it on the first try, second try, or third try) and  $j \in \{0, 1, 2, 3, 4\}$  (represents what day of the competition the team got the question on). Additionally,  $N$  represents the number of teams that got the question right and  $n$  represents the question number (in this regard, expect all questions to be ordered by difficulty). The cumulative score of a submission will be determined by the sum of these values. With this scoring system, ties will be very unlikely.

## 2 OPhO Open Contest Results

Thank you to the **340 teams** from over **45 countries** that competed in the 2020 Online Physics Olympiad Open Contest! We hope that you enjoyed the competition and will return to compete again next year. To summarize our decisions, we have chosen a total of **39 teams** to compete in the Online Physics Olympiad Invitational Contest, which will be running in July or August 2020. Additionally, we have awarded **29 teams** with the "*High Honors*" distinction and **28 teams** with the "*Honors*" distinction. Congrats to all of our awardees!

This year's winner of the first ever Online Physics Olympiad is *Everything is Relative*; 2nd place is awarded to *Team Jaipur*; 3rd place is awarded to *Physics Geniuses*! Below are summary of statistics; more detailed results/stats are on the next few pages.

Invitational Qualification Cutoff Score	130
High Honors Cutoff Score	140
Honors Cutoff Score	105
Top Score	181.662
Top Individual Score	169.718
Minimum Score	0
Least Solved Problem	Pr. 53
Most Solved Problem	Pr. 6

## 2.1 Rankings: #1-57

Ranking	Team Name	Team Members	score	Country
1	Everything is Relative	Chahel Singh, Vaibhav Raj, Lakshay Gupta	181.662	India
2	Team Jaipur	Mridul Agarwal, Tejas Kumar, Sanandh Kataria	179.519	India
3	Physics Geniuses	Pritesh Mehta, Parth Patel, Ananthkrishna Kidambi	177.78	India
4	Maxwell's Demons1	Arnav A. Singh, Ameya P Deshmukh, Siddhant Mukherjee	175.695	India
5	Oachkatzlschwoaf	Jonathan Gräfe, Erik Sünderhauf, Max Schneider	175.268	Germany
6	Quantum Tined	Ojaswi Jain, Tanmay Dokania, Aaryan Kumar Gupta	174.808	India
7	d-s	Daniel Sun	169.718	USA
8	PHO	Brian Xu, Rupert Li, Gopal Goel	168.327	USA
9	GALAXY	Mousam Biswas, Sanmit Chakraborty, Purnendu Das	167.999	India
10	The Newtonians	Pritam Acharya, Sarthak, Danish Javed	165.21	India
11	The Time	M. Shashank Balaji, Vivek G. Sabarad	164.236	India
12	Valley Christian USAPhO Squad	Vittal Thirumalai, Alex Gu, Jennifer Song	161.848	USA
13	Two-Form	Sai Sanjay Narayanan, Raghuram Sundararajan	160.923	India
14	Vectorious	Vibhu Ravindran, Harihar Swaminathan, Sudharshan K V	157.567	India
15	Idk	Mohammad Furquan	156.367	India
16	Blank Ideas	Jonathan Willianto, Wilsen Chandra Putra	155.347	Indonesia
17	HXII Tööööörch!	Simon Dima, Maurice Debray, Victor Miquel	153.724	France, USA
18	KeshiEgg	Keita Tsuji, Ryunosuke Baba, Keita Okano	153.293	Japan
19	Leo Lover 2016	Leo Yao, Akhil Paulraj, Parth Shastri	152.934	USA
20	Blatarii	Isfan Alexandru-Stefan, Covei Denis, Gutoiu Raj Alexandru	152.24	Romania
21	UraVity	Ayhan Suleymanzade , Murad Bashirov, Siraj Yahyazade	151.58	Azerbaijan
22	Astrofiziks Klub	Sahil Pontula, Joe McCarty, April Cheng	151.555	USA
23	Harmonic Approxillators	Ronald Doboš, Marcel Polák, Jozef Csipes	148.465	Slovakia
24	In Sandu We Trust	Dumbravă V Ioan, Coadă A. Georgiana, Ailiesei A. Maria	147.728	Romania
25	Endians	Anant Lunia, Jaivardhan Singh, Varun Tokas	143.496	India
26	Japan Team for (imaginary)IPhO2020	Tasuku Ono, Haruto Kitagawa, Yasutaka Sasaki	143.148	Japan
27	Dumbledore's Army	N/A (3 members)	142.409	USA, India
28	HK OPhO Team 1	Lau Sze Chun, Ng Chi Kin, Guo Allan	141.625	Hong Kong
29	YeeTBots	Anilesh Bansal, Shashwat Kasliwal, Satyankar Chandra	140.364	India
30	$\pi = e = \sqrt{g} = 3$	Kartik Nair, Salil Gokhale	135.605	India
31	Monta Vista	Aditya Bhardwaj, Jacob Nie, Brandon Guo	135.363	USA
32	Invincible343	Satyam Kumar Roy, Zainul Niaz	135.147	India
33	Peek-a-boo	Wei-Hua Yan, Jie-Da Tsai, Kai-Xiang Tu	133.895	Taiwan
34	kaons	Akhil Sadam, David Li	133.815	USA
35	Charter Physics Team	Heran Yang, Parth Rustagi, Albert Xing	133.067	USA
36	HX1 Törch	Victor Lequin, Andrei Barbu, Leonardo Finocchiaro	132.968	France
37	AAA	Kwanit Gangopadhyay, Aadil Akhtar, Mainak Roy	132.151	India
38	Corpus Physti	Ollie Breach, Issac Jacob, James Walkling	131.741	UK
39	Rusyanabutu in Love	Masahiro Hamada, Yuki Inada, Koki Kusumoto	131.026	Japan
40	Electrodynamic Slayers	Arhaan Ahmad, Khuswind Maurya, Vatsal Varshney	129.054	India
41	Elastic Gummy Bears	Jonathan Qin, Evan Kim, Alan Abraham	128.732	USA
42	The Byzantine Empire	Wenjun Hou	128.622	USA
43	The OG Squad	Vincent Xu, Benjamin Wang, Kevin You	128.14	USA
44	Fysix	Subhash Kantamneni, Bill Li, Jason Liu	125.968	USA
45	Professional Dumbasses	Tan Jun Wei, Paul Seow Jian Hao, Alexander G.Z. Han	125.714	Singapore
46	Bill Nye the Science Guy	William Nye	125.395	USA
47	Turn Down for Watt	Timothy Ho	123.823	Singapore
48	We're Saving this for Late	Henry Ding, Andrew Gu	122.669	USA
49	HK Team D	Li Min Hang, Leung Chun Fung, Szeto Chun	122.615	Hong Kong
50	Steve and Son	Brandon Lu, Richard Bi, Andrew Liu	119.715	USA
51	GoldenTulipFanClub	Omar Islam Laskar, Arnav Garg, Pranav Prakash	117.57	India
52	HX3 LLG	Cyriaque Amerein, Timothé Ringear	117.295	France
53	Eupho2019DreamTeam	Jaroslav Herman, Martin Vavřík, Václav Zvoníček	114.465	Czech Republic
54	aeshs	Emily Lu, Jared Machtinger, Joshua Tsai	113.755	USA
55	Naperville Nachos	Kevin Cheng, Geoffrey Wu, Henry Xie	110.609	USA
56	The Bohring company	Vedant Sharma, Harshvardhan Ahirwar, Aditya Jain	108.067	India
57	Tom and Jerry and Jerry	Hajime Amo, Yudai Hiraishi, Ritaro Yamada	107.077	Japan

## 2.2 Question Analysis

Question Number	Number of Teams Solved
1	165
2	131
3	VOID
4	110
5	132
6	183
7	146
8	125
9	144
10	135
11	130
12	117
13	141
14	92
15	60
16	101
17	98
18	130
19	54
20	104
21	147
22	130
23	50
24	82
25	131
26	142
27	125
28	33
29	107
30	80
31	110
32	55
33	70
34	41
35	VOID
36	104
37	55
38	60
39	90
40	18
41	33
42	77
43	60
44	31
45	VOID
46	72
47	78
48	72
49	59
50	46
51	39
52	41
53	13
54	19
55	69