IEPC 19

36th International Electric Propulsion Conference
Vienna

ENPULSION

Programme

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Platin

ENPULSION

Gold

AEROJET ROCKETDYNE · AEROSPACE · arianeGROUP · FACHHOCHSCHULE WIENER NEUSTADT · FOTEC · SAFRAN · SITAEL

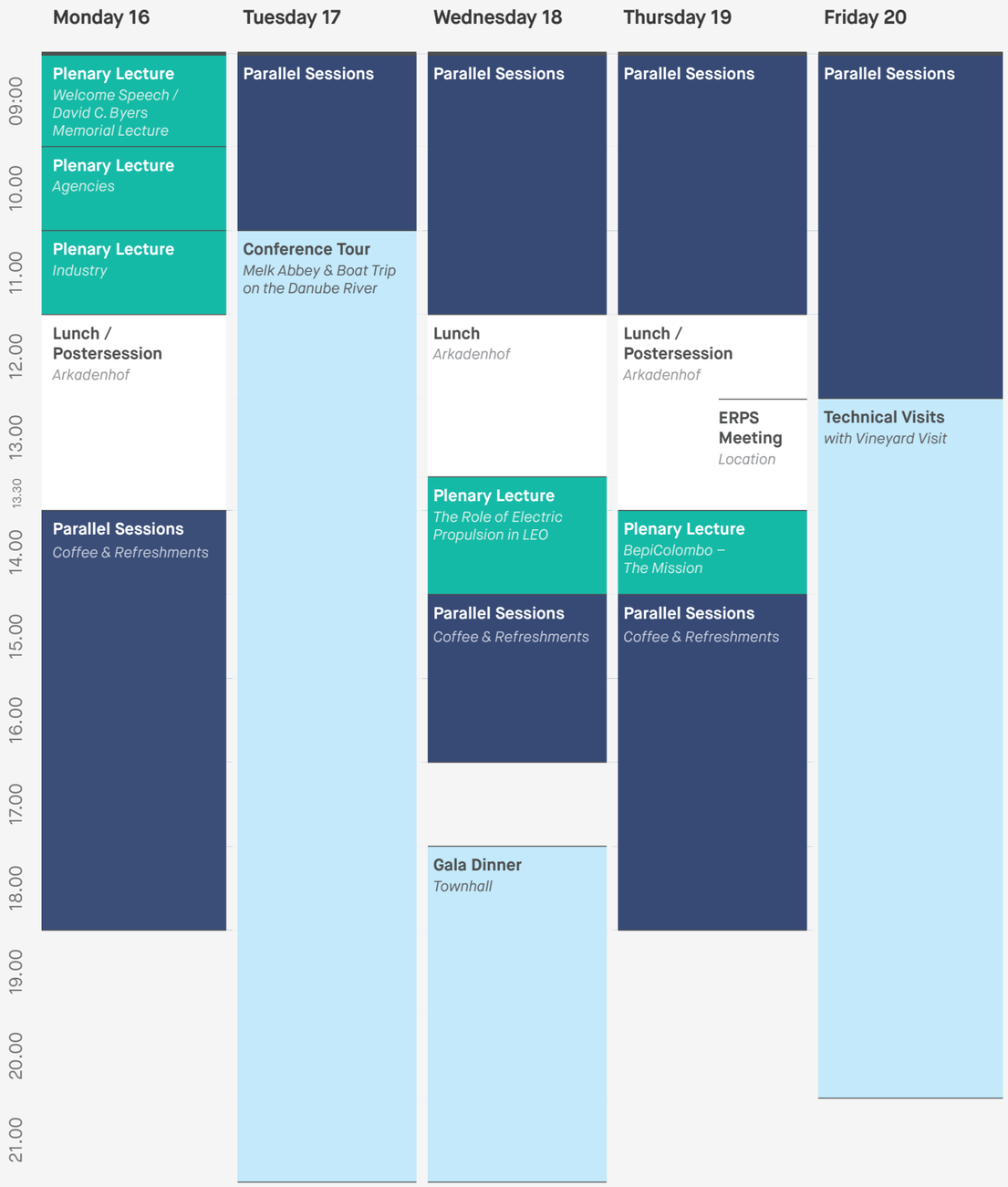
Exhibitors

BUSEK Space Propulsion and Systems · COBHAM · THE LINDE GROUP Linde · RAFAEL ADVANCED DEFENSE SYSTEMS LTD. · Together ahead. RUAG · UZAY · VACCO

Promotion Agency

FFG Forschung wirkt.

Content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Agencies
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Conference Tour
Melk Abbey & Boat Trip on the Danube River
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The Role of Electric Propulsion in LEO
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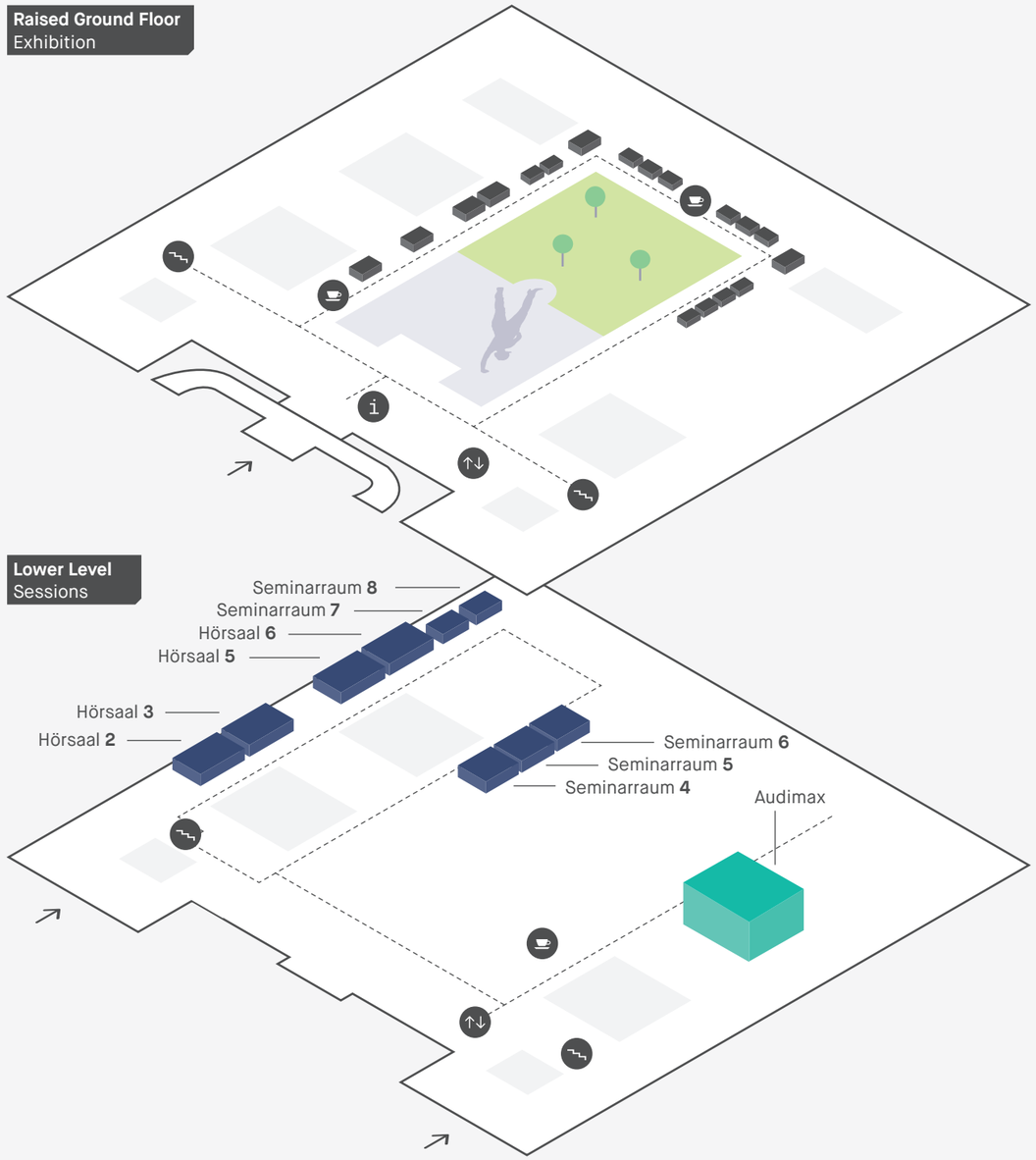
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Ahedo Galilea, E.					09:30 HS5
Akhare, D.			17:00 HS2		
Akhmetzhanov, R.				15:30 HS5	
Altmann, C.			09:30 HS6		
Alvarez Laguna, A.			15:15 SR7		
Andreano, T.	16:00 SR7				
Andreussi, T.	15:00 SR6 17:45 SR6	09:00 SR7 09:15 SR7 10:45 SR6		17:30 HS3	
Antypas, R.	14:45 SR5				
Aoyagi, J.	17:00 SR4				
Arai, Y.				15:30 HS2	
Araki, S.			09:00 SR7 09:15 SR7		
Arthur, N.				11:45 HS5	
Ataka, Y.				17:00 HS5	
Aydin, B. C.					09:45 HS2
Bai, S.			10:00 HS2		
Baird, M.				10:00 SR6 11:15 SR6	
Bak, J.				10:15 SR6	
Barbier, P.					09:00 SR5
Barchowsky, A.			10:30 SR8		
Bathgate, S.				17:30 HS2	
Bauer, P.				18:45 HS5	
Baxter, T.			15:45 HS2		
Becatti, G.		09:45 HS6 10:45 HS6			
Behnke, A.				09:00 SR8	
Bell, A.	14:30 HS2				
Bello-Benítez, E.					09:15 SR7
Berenguer, C.				18:45 HS3	
Bhat, S.				18:15 SR6	
Bilyeu, D.				09:45 SR7	
Blanchet, A.				10:00 HS3	
Blaser, M.			09:30 SR8		
Boeuf, J.-P.				16:00 SR7	
Bogatyi, A.		09:15 SR4			
Boniface, C.	14:00 Audimax				
Bosch Borràs, E.					09:00 SR6
Bosch, E.	15:00 HS2				
Bosi, F.			11:45 HS6		
Bourguignon, E.			10:15 SR8		
Boxberger, A.				10:45 SR8	
Brieda, L.			10:15 SR7 15:00 SR4		
Brophy, J.			09:30 HS5		
Brown, N.				09:30 SR6	
Brown, Z.					12:15 SR7
Byrne, M.	18:30 SR7				
Cannat, F.	16:00 HS5	10:15 HS5			

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Cao, X.-F.			10:45 SR7		
Carroll, D.	15:15 SR4				
Carter, M.			15:15 HS3		
Cassady, J.	14:30 SR8				
Celik, M.				10:30 HS5	
centola, s.	18:15 HS5				
Chan, Y.-A.				10:45 HS3 18:00 HS3	
Chang, L.			09:15 SR4		
Chaplin, V.	14:00 SR7 14:15 SR7				
Charoy, T.				09:00 SR7	
Che, B.			09:00 HS3		
Chen, J.			16:30 SR7		
Chen, K.-Y.				11:15 HS3	
Chen, X.			15:30 HS6		
Chen, Z.			10:15 HS3		
Chenguang, L.				09:30 HS2	
Cho, S.					12:30 SR7
Chubov, P.			15:45 SR7		
Ciaralli, S.			09:15 SR6		
Cichocki, F.			09:45 HS2		
Clark, S.				16:30 HS6	
Collins, A.		09:00 SR5			
Cong, Y.				09:45 SR8	
Conversano, R.		10:00 SR6 10:15 SR6			
Cope, D.				16:45 SR8	
Coral, G.			11:15 SR4		
Correyero Plaza, S.			11:30 HS2		
Courtney, D.	17:00 SR5		17:00 SR5		
Cretel, C.		10:45 HS2			
Crofton, M.	18:00 HS2			17:45 HS5	
Cui, C.		10:00 HS5			
Cui, K.		10:00 SR7			
Cusson, S.	15:00 SR7 18:45 SR6				
Dale, E.				17:15 SR7 18:00 SR7	
Daniels, K.	17:15 SR4				
Davis, M.	17:45 SR5				
Daykin-Iliopoulos, A.	16:15 HS6				
Demmons, N.	14:30 SR5				
Derntl, A.	16:15 HS3				
Dietz, C.	15:45 HS2				
Dietz, P.			09:15 HS6		
Ding, M.				18:45 SR7	
Ding, Y.				17:45 SR6	
Dobranszki, C.				17:00 HS2	
Doh, G.				10:45 SR6	
Domínguez-Vazquez, A.					12:45 SR7
Drobny, C.	15:00 HS6				

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Duchemin, O.			09:00 SR6		
Eckhardt, D.				09:45 HS2	
Edamoto, M.			16:15 HS3		
Egawa, Y.				17:30 SR6	
Ehresmann, M.	14:45 HS2				
Eichhorn, C.				10:15 HS5	
Elias, P.-Q.					09:45 SR6
Fajardo, P.				10:00 SR7	
Fazio, N.		09:45 HS5			
Feili, D.	15:30 SR8				
Ferreira, J.			11:45 SR6		
Filleul, F.			16:30 HS6	16:45 HS6	
Ford, N.	17:30 SR5				
Frieman, J.	18:15 SR7				
Friss, A.		09:30 HS6			
Fruchtman, A.					10:15 SR7
Fu, Y.	15:00 HS5				
Funaki, I.	16:15 SR7				
Furukawa, T.			15:00 HS2		
Furuya, R.			16:15 HS6		
Gabriel, S.			11:30 HS6		
Gallud Cidoncha, X.				15:45 HS2	
Garcia, V.	15:15 SR7 17:15 HS6				
Garner, C. E.					10:00 HS2
Garrigues, I.			15:00 HS6	10:30 SR7	
Geng, J.	18:15 SR4				
Genovese, A.			09:45 HS5		
Georgin, M.				09:00 HS6 11:45 HS6	
Gessini, P.			16:30 HS2		
Gilpin, M.			09:00 SR5		
Glascock, M.	16:00 SR4				
Glogowski, M.	14:45 SR8				
Goebel, D.		10:30 HS6			
Gole, H.				09:15 SR6	
Gómez, V.				17:15 HS2	
Gondol, N.			10:15 SR6		
Gonzalez del Amo, J. A.	09:30 Audimax				
González, J.				16:00 HS2	
Gray, H.				15:30 HS6	
Gray, T.				15:00 SR6	
Greve, C.				09:30 SR7	
Grimaud, L.			10:30 SR5		
Groll, C.			10:00 SR6		
Guan, C.					10:00 SR5
Guerrero, P.			10:15 HS6 10:45 HS6		
Guglielmi, A.				18:15 SR7	
Guo, Y.			16:30 SR5		
Gurciullo, A.	15:30 SR7		10:30 HS6		
Habl, L.				11:30 HS5	

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Hall, S.	14:00 HS6 14:15 HS6				
Hallouin, T.				15:45 SR6	
Ham, R.	16:30 HS6				
Hamada, A.		10:15 HS2			
Hang, G.					09:30 SR5
Hara, K.					11:15 SR7
Hari Prasad, N.			11:45 HS2		
Harmansa, N.				15:45 HS3	
Harte, P.					09:45 HS5
Haverty, M.	14:15 HS2				
He, W.			09:30 HS3		
Heidemann, R.		10:30 SR6			
Henning, T.	15:30 SR5				
Hepner, S.				09:00 HS3	
Herdrich, G.					10:00 SR6
Herdrich, G.				11:15 SR8	
Herman, D.		10:30 SR7			
Hess, S.			11:15 SR7		
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Hu, Y.	17:45 SR7				11:30 SR7
Huang, W.	19:00 SR7				
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Huh, H.			16:30 SR5		
Hurley, S.	14:00 SR4				
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Jakubczak, M.		09:30 SR7			
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Jarrige, J.		09:15 HS2			
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Jia, Y.			15:00 HS5	12:00 HS6	
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Jorns, B.	14:00 SR6		15:15 SR5		
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Junker, J. E.			09:15 SR8		
Kaganovich, I.					10:45 SR7

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Karadag, B.							**09:15**	HS6		
Karevsky, A. V.			**09:15**	SR8						
Katsonis, K.							**18:30**	HS3		
Kawashima, R.					**15:00**	SR7				
Kazeev, M.			**09:15**	HS3						
			09:30	HS3						
Keerl, S.					**09:45**	SR5				
Kelly, C.	**14:00**	HS3								
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Khan, U.	**14:45**	HS5								
Khmelevskoi, I.							**11:45**	SR6		
Kim, M.							**17:15**	HS3		
Kim, V.					**10:45**	SR6				
Kimber, A.	**16:15**	SR5								
Kinefuchi, K.							**10:30**	SR6		
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Kolbeck, J.	**15:30**	SR4								
Komarov, A.									**11:45**	SR7
Kottke, N. G.	**15:15**	HS6								
Kozhevnikov, V.							**16:00**	HS5		
Kralkina, E.			**09:15**	HS5						
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Krejci, D.					**11:15**	SR5				
Kristinsson, B.			**10:00**	SR5	**15:45**	HS3				
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Leiter, H.							**09:15**	SR4		
							17:15	HS5		
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Lev, D.	**14:15**	SR8			**10:45**	SR8	**09:00**	SR4	**11:00**	HS2
	16:00	SR8			**11:00**	SR8				
Levchenko, I.					**15:30**	HS3				

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Levin, D.	**16:30**	HS5			**15:45**	SR5				
Li, G.					**16:00**	HS6				
Li, W.	**14:45**	SR7								
Li, X.					**15:00**	HS3				
Li, Y.							**15:15**	SR8		
Liang, S.									**09:30**	SR7
Iijuan, L.	**17:45**	HS3								
Lilly, R.					**10:00**	HS3				
Ling, W. Y. L.	**16:45**	SR4								
Little, J.	**18:30**	HS3								
Liu, H.					**10:30**	SR7				
Liu, X.	**16:30**	SR5			**10:45**	HS3				
	18:00	SR4								
Lobbia, R.							**17:15**	SR6		
Long, J.	**14:30**	SR4								
Lopez Ortega, A.					**10:00**	SR7				
					16:00	SR7				
Lopez Reig, J.	**14:00**	SR8								
Lovtsov, A.	**16:30**	SR7					**16:15**	HS5		
Lucken, R.			**09:30**	HS5						
M. Ahmed Rudwan, I.	**14:30**	HS6								
Ma, C.	**16:00**	SR5			**11:30**	SR8				
Magarotto, M.					**09:15**	HS2				
Makela, J.							**17:00**	SR6		
Mallon, M.	**18:00**	HS5								
Malone, S.			**10:00**	SR8						
Mani, K. V.									**10:45**	HS2
Mao, W.							**18:00**	SR6		
Markov, A.					**15:00**	SR6				
Marmuse, F.	**19:00**	HS3								
Marrese-Reading, C.			**09:45**	SR5						
Martín Ortega, Á.							**16:15**	SR7		
Martin, R.							**15:00**	SR7		
Martínez Martínez, J.					**10:00**	HS5				
Marusov, N.							**17:45**	SR7		
Masillo, S.					**12:00**	SR6				
Massotti, L.					**10:45**	SR5				
Masuyama, K.	**17:15**	HS2								
Matlock, T.	**15:30**	SR6					**16:00**	SR6		
	16:30	HS2								
Matsunaga, Y.					**15:15**	HS5				
Matyash, K.							**11:15**	SR7		
Maya, P. N.			**09:00**	HS5						
Mazouffre, S.							**11:00**	HS6		
McDonald, M. S.							**10:15**	HS6		
							11:30	HS6		
Meng, T.							**09:45**	HS6		
Merino, M.	**14:15**	HS3								
Micci, M.	**18:15**	HS3			**09:45**	SR4				
Mikami, T.			**10:00**	SR4						
Mikellides, I.	**18:00**	SR7								
Miller, C.	**15:00**	SR5								

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Mishra, A.		09:15 SR6			
Misuri, T.	17:30 SR6 18:00 SR6				09:30 HS2
Moloney, R.				09:15 HS3	
Monette, M.				17:00 HS3	
Montag, C.		10:15 SR4			
Mooney, M.	15:45 HS6				
Morishita, T.	14:45 HS6				
Mühlich, N. S.			09:30 SR5		
Mullins, C.		09:00 SR6			
Muranaka, T.			11:45 SR7	09:30 HS5	
Murayama, Y.				16:30 SR8	
Nagamine, K.			16:15 SR6		
Nakagawa, Y.				18:30 HS5	09:15 SR6
Nakles, M.				11:00 SR6	
Natisin, M.	16:45 SR5				
Nauschütt, B.				10:00 HS5	
Navarro Cavalle, J.			15:30 HS2	16:45 HS2	
Neugodnikov, S.		10:15 SR8	09:45 SR8		
Neumann, A.	17:00 HS2				
Neunzig, O.				10:30 HS3	
Ning, Z.				09:30 HS6	
Nuwal, N.	16:15 HS5				
Ogunlesi, C.			10:15 SR4		
Oh, D.					09:00 HS2
Ohlinger, W.				10:30 HS6	
Olano Garcia, A.	17:30 SR7				
Olshanskaya, O.	16:30 SR6				
Ontaç, S.					10:30 SR5
Oshio, Y.	17:30 HS3				
Ottaviano, A.					09:30 SR6
Packan, D.				11:00 HS2	
Pan, R.			12:00 SR7		
Panelli, M.			11:15 HS6		
Pavarin, D.		10:45 SR8		10:00 HS2	
Pedrini, D.			09:00 HS6		
Perales-Díaz, J.	17:30 HS5				
Perez Luna, J.			09:00 HS5		
Peterschmitt, S.				09:00 HS2	
Peterson, P.			11:00 SR6		
Petrenko, O.	15:45 SR7	09:00 SR8			
Petro, E.	17:15 SR5		16:00 SR5		
Pintó Marín, F. J.			11:15 SR8		
Polk, J.		09:00 HS3	16:00 HS5	10:45 HS6	
Polzin, K.	19:00 SR4				
Porst, J.-P.				17:30 HS5	
Porto, J. C.			09:00 HS2		
Porto, M.	16:15 SR6				
Potrivitu, G.-C.		10:00 HS6 10:15 HS6			
Powis, A.				17:00 SR7	
Proulx, N.			15:30 SR6		

Name A → Z	Monday 16	Tuesday 17	Wednesday 18	Thursday 19	Friday 20
Qin, Y.		09:45 SR4			
Quraishi, A.				15:00 HS2	
Raisanen, A.				10:15 SR7	
Raitses, Y.				17:30 SR7 18:30 SR7	
Rakhimov, R.	15:45 HS5				
Randall, P.			09:15 HS5	15:45 HS6	
Reeh, A.	17:00 HS5				
Reeve, S.			09:45 HS6		
Reitemeyer, M.				10:00 HS6	
Ren, J. X.				15:15 HS5	
Ren, Q. Y.		10:00 HS3			
Richards, M.		09:45 SR8			
Robinson, M.			10:00 SR4		
Roessler, C.		10:30 SR8			
Rojas Mata, S.		10:30 HS2			
Romano, F.				15:00 HS3	
Romei, F.			09:30 SR4		
Rongione, N.		09:00 HS2			
Ross, J. L.				15:15 SR6	
Rovey, J.				15:15 HS3	
Ryan, C.			16:45 HS2		
Sahu, R.				11:45 SR7	
Salvatore, V.	17:00 SR6				
Sammut, M.	15:00 SR4				
Samples, S.			11:15 HS5		
Sánchez-Villar, A.			11:00 HS3		
Saravia, M. M.			15:15 SR6		
Sarrailh, P.			11:30 SR7		
Sasoh, A.				11:30 HS3	
Sato, Y.	14:00 HS5				
Scharlemann, C.			11:00 SR5		
Scholze, F.				11:15 HS5	
Schönherr, T.			10:15 SR5		
Schwertheim, A.			09:45 HS3		
Seifert, B.	16:00 HS2				
Sekerak, M.					10:15 HS2
Sekine, H.				09:45 SR6 16:15 HS2	
Shark, S.				16:15 HS3	
Shashkov, A.	16:45 SR7				
Shaw, P.	18:45 SR4			09:15 SR7	
Shen, Y.			10:30 SR4		
Sheppard, A.	14:30 HS3				
Shin, J.			10:15 HS5		
Shimhanda, S.	14:15 SR4				
Simmonds, J.		10:15 SR7	10:30 SR6		
Singh, S.				15:30 SR7	
Sizov, A.	15:00 SR8				
Skalden, J.			09:00 SR4 11:00 SR4		
Skalden, J.					

Name A → Z	Monday 16		Tuesday 17		Wednesday 18		Thursday 19		Friday 20	
Slough, J.	**16:30**	HS3								
Slough, J.			**09:45**	HS3			**10:15**	HS3		
Smirnov, P.	**17:30**	HS6								
Smirnova, M.							**16:30**	HS5		
Smolyakov, A.	**16:00**	SR6							**10:30**	SR7
									11:00	SR7
Snyder, S.									**09:15**	HS2
Soendker, E.					**11:45**	SR8				
Sommavilla, T.	**15:30**	HS5								
Sommerville, J.	**17:00**	SR7								
Song, J.					**11:15**	HS2				
Song, P.	**15:15**	SR5								
Spemann, D.							**11:45**	HS3		
Squire, J.					**09:00**	SR8				
Staab, D.							**10:15**	HS2		
							10:30	HS2		
Starchenko, A.			**09:30**	SR8						
Stark, J.							**11:15**	HS2		
Steiger, C.							**15:15**	HS6		
Stesina, F.					**16:15**	HS2				
Su, L.	**14:30**	SR6								
Surminskii, A.					**12:15**	SR8				
Sutherland, O.									**10:30**	HS2
Suvorov, M.							**15:45**	HS5		
Swar, K.	**16:15**	HS2								
Taccogna, F.							**11:00**	SR7		
Tachibana, T.					**15:45**	SR4				
Tacon, C.					**09:15**	SR5				
Tajmar, M.					**10:00**	SR5	**09:30**	HS3		
							09:45	HS3		
Takahashi, K.	**18:45**	HS3			**16:00**	HS2				
Takahashi, M.							**15:15**	HS2		
Takao, Y.	**14:00**	SR5								
Tatsuno, A.					**15:15**	HS2				
Tauchi, S.							**09:15**	SR8		
Taunay, P.-Y.			**09:00**	HS6						
Tavant, A.									**10:00**	SR7
Thomas, R.							**18:15**	HS5		
Thompson, S.	**16:00**	HS6								
Thoreau, P.			**09:45**	HS2						
Thuppul, A.			**09:30**	SR5						
Thüringer, R.							**11:00**	HS5		
Tian, B.	**15:00**	HS3								
Tighe, W.							**09:00**	SR6		
Tonooka, S.							**09:30**	SR8		
Toso, M.	**17:00**	HS6								
Trescott, J.	**15:15**	HS2								
Trottenberg, T.									**10:15**	SR6
Tsay, M.					**15:45**	HS5				
Tsikata, S.									**12:00**	SR7
Tsuchiya, M.					**15:30**	SR4				

Name A → Z	Monday 16		Tuesday 17		Wednesday 18		Thursday 19		Friday 20	
Tsukizaki, R.							**09:15**	HS5		
Tsybulnyk, A.					**10:00**	SR8				
Turchi, P.	**18:00**	HS3								
Tverdohlebova, E.	**15:15**	SR8								
Uchizono, N.			**09:15**	SR5						
Ueno, K.							**16:15**	SR8		
Upadhyay, P. P.					**15:15**	SR4				
Vafabakhsh, A.					**10:45**	HS5				
VanWoerkom, M.	**18:45**	SR7								
Vaudolon, J.	**17:15**	SR6								
Vaupel, M.					**16:00**	SR6	**16:00**	HS3		
Vazsonyi, A. R.					**11:00**	HS6				
Velasco Valencia, R.							**15:00**	HS6		
Viges, E.	**17:45**	HS2								
Villafana, W.					**16:15**	SR7				
Villemant, M.					**15:00**	SR5	**15:15**	SR7		
Vincent, B.							**15:30**	SR6		
Volkmar, C.							**09:00**	HS5		
Wachs, B.							**09:15**	HS2		
Wada, A.							**16:30**	HS2		
Wallace, N.							**16:00**	HS6		
Wang, G.							**10:00**	SR8		
Wang, J.					**15:30**	SR5				
Wang, X.									**09:15**	SR5
Wang, Y.							**11:00**	SR8		
Wang, Y.-F.	**15:45**	SR6								
Watanabe, H.							**16:30**	SR7		
Wegner, T.			**09:15**	HS6						
Wei, L.					**09:30**	SR7				
Weis, S.							**10:45**	HS2		
Wen, X.	**16:45**	HS3								
Wijnen, M.			**09:30**	HS2						
Williams, J.	**18:30**	HS5								
Winter, M.					**16:00**	HS3				
Wirz, R.	**17:00**	HS3								
Woods, J.	**15:15**	HS3								
Wright, P.	**15:45**	SR5								
Wu, N.					**16:45**	SR7				
Wu, P.							**10:15**	SR8		
Yamakawa, Y.					**10:15**	HS2				
Yamamoto, N.									**09:00**	SR7
Yamasaki, J.					**16:45**	SR6	**15:30**	SR8		
Yamashita, Y.	**14:30**	HS5								
Yang, L.			**09:00**	SR4						
Yang, W.	**15:30**	HS6								
Yang, X.			**10:00**	HS2						
Yi, X.							**16:15**	SR6		
Yim, J.					**15:30**	HS5				
Young, J. A.							**11:15**	HS6		
							18:00	HS5		
Yurttas, Y.									**09:45**	SR5

Name A → Z	Monday 16		Tuesday 17		Wednesday 18		Thursday 19		Friday 20
Zadiriev, I.	**17:15**	HS3							
Zarakovskiy, A.	**16:45**	HS6							
Zeng, M.							**16:45**	SR7	
Zhang, Y.							**15:00**	SR8	
Zhang, Z.			**09:30**	SR4			**18:15**	HS3	
Zhao, H.			**10:15**	HS3					
Zheng, H.	**15:15**	HS5							
	17:15	HS5							
Zhou, C.							**17:00**	SR8	
Zhou, J.					**10:30**	HS3			
Zhu, K.					**10:30**	HS5			
Zhu, X.							**09:45**	HS5	
Ziemer, J.					**11:45**	SR5			
Zitouni, B.	**15:30**	HS2							
	16:45	HS2							
Zolotukhin, D.	**16:15**	SR4							
Zurbach, S.			**09:30**	SR6					

MONDAY

09.00 **Wecome Speech** — Audimax

09.30 **David C. Byers Memorial Lecture** — Audimax

10.00 **Plenary Lecture** Agencies — Audimax

11.00 **Plenary Lecture** Industry — Audimax

12.00 Lunch Break & Poster Session

14.00 **Plenary Lecture** European National Agencies — Audimax

14.00

Material Technology Cathodes, Gimbals — HS6

A299
The Effect of Neutral Gas Injection in the Keeper Orifice of a 25-A class Hollow Cathode
S. Hall

Field Emission / Colloid Thrusters — SR5

A149
Development of Ionic Liquid Electrospray Thrusters with a Massive Emitter Array for Higher Thrust Density
Y. Takao

Hall Thrusters 1 — SR6

A129
Hybrid Data-Driven and Physics-Based Model for Plasma Turbulence in a Hall Effect Thruster
B. Jorns

Hall Thrusters 2 — SR7

A532
Spatiotemporally Resolved Ion Velocity Distribution Measurements in the 12.5 kW HERMeS Hall Thruster
V. Chaplin

Ion Thrusters — HS5

A154
Three-Dimensional Particle Simulations of Electron Extraction for a Miniature Microwave Discharge Neutralizer Using Water as the Propellant
Y. Sato

14.15

A300
The Role of Neutral Pressure Due to Anode Geometry in Hollow Cathode Mode Transitions
S. Hall

A173
Laboratory Demonstration of a Staging System for Electrospray Thrusters
O. Jia-Richards

A147
Modular Comprehensive Modeling of Plasma Behavior in Hall Thrusters
T. Andreussi

A531
Ion Velocity Measurements in the Magnetically Shielded Miniature Hall Thruster (MaSMi) Using Laser-Induced Fluorescence
V. Chaplin

A309
Lifetime Evaluation of Microwave Discharge Neutralizer using Numerical Analysis
N. Hiorike

14.30

A406
Development of a Diamond-Based Cold Cathode for Space Propulsion Applications
I. M. Ahmed Rudwan

A225
Colloid Micro-Thruster (CMT) Component Development Testing Towards Meeting LISA Mission Requirements
N. Demmons

A204
Model for the Increase in Thruster Efficiency from Cross-Channel Coupling in Nested Hall Thrusters
L. Su

A513
Charge Exchange Collision in the Plume of a 200 W Laboratory Hall Thruster
M. Baird

A218
Numerical study of microwave discharge ion thruster μ10
Y. Yamashita

Pulsed Plasma Thrusters — SR4

A184
The Modular Micro-Cathode Arc Thruster
S. Hurley

A185
A Performance Comparison of solid Propellants in a Surface Arc Thruster: Sulfur and Teflon
S. Shimhanda

A273
A Coupled-inductive Energy Storage Power Processing Unit for Micro-cathode Arc Thruster
J. Long

Commercial Propulsion Needs — HS2

A303
Versatile Xenon Flow Controller for Extended Hall Effect Thruster Power Range
G. Lenguito

A505
New Propellant Approval at Apollo Fusion Inc.—Activities to Support Industry and Regulatory Approval of New Propellant
M. Haverty

A721
Development of an additively manufactured mass, volume and cost optimised fuel tank for microsatellite propulsion systems MiniTank
A. Bell

Global Strategic Invests — SR8

A189
Activities of the H2020 Strategic Research Cluster on Space Electric Propulsion (2015-2019)
J. Lopez Reig

A602
Evolution and Characteristics of the Use of Electric Propulsion for Low Earth Orbit Satellites
D. Lev

A711
The Importance of Electric Propulsion to Future Exploration of the Solar System
J. Cassady

Innovative Concepts — HS3

A202
Performance Scaling of Drag-Modulated Plasma Aerocapture
C. Kelly

A254
Fluid-kinetic propulsive magnetic nozzle model in the fully-magnetized limit
M. Merino

A420
Theoretical scaling laws for water-vapor propellant thrusters
A. Sheppard

	Material Technology Cathodes, Gimbals	Field Emission / Colloid Thrusters	Hall Thrusters 1	Hall Thrusters 2	Ion Thrusters
	HS6	SR5	SR6	SR7	HS5
14.45	**A557** Development of a Microwave Discharge Cathode for a 200 W Class Hall Thruster *T. Morishita*	**A372** Pure Ionic Electrospray Extractor Design Optimization Utilizing Additive Manufacturing *R. Antypas*	×	**A220** Study on the Influence of Electron Conduction Paths on the Ignition Process of Hall Thruster *W. Li*	**A868** Performance Improvement and Testing of a Micro-wave ECR Neutraliser for a Gridded Ion Thruster *U. Khan*
15.00	**A629** Development of a C12A7 Electride Hollow Cathode and Joint Operation with Plasma Thrusters *C. Drobny*	**A277** The Effect of Ionic Liquid Composition on Ion Electrospray Thruster Performance *C. Miller*	**A459** Magnetic Circuit Optimization for Hall Thrusters Design *T. Andreussi*	**A276** Experimental Investiga-tion of the Implications of Nesting Multiple Hall Thruster Channels *S. Cusson*	**A706** Two-Dimensional Particle-in-cell Simulation of 10 cm Microwave Neutralizer *Y. Fu*
15.15	**A644** Comparison of the thermi-onic emission properties of LaB6 and C12A7 *N. G. Kottke*	**A284** Micro-Newton Electros-pray Thrusters for China's Space-Borne Gravitational Wave Detection Mission (Tian Qin) *P. Song*	**A470** Theoretical Models of Suppression of Instabil-ities in Hall Thruster by Shear of Magnetic Field *A. Kapulkin*	**A288** EP system development and functional validation tests for the Electra GEO satellite *V. Garcia*	**A272** Hybrid-PIC Simulation of Back-sputtered Carbon Transport in electric propulsion test facility *H. Zheng*
15.30	**A482** Development of High Current LaB6 hollow Cathode *W. Yang*	**A344** Characterisation of electrospray microemit-ters fabricated by planar and 3D photolithography *T. Henning*	**A278** A Comparison of Possible Mechanisms for Facility Effects on Hall Thruster Operation *T. Matlock*	**A142** Hall thrusters develop-ment at Exotrail: pres-entation and experimental investigation *A. Gurciullo*	**A302** EMC considerations for RIT engines based on 3D full-wave field simulation of electromagnetic emission of their RF coils *T. Sommavilla*
15.45	**A695** Featherweight Heaterless Hollow Cathode Charac-terization *M. Mooney*	**A650** A Novel Variable Mode Emitter for Electrospray Thrusters *P. Wright*	**A306** A comprehensive xenon collisional-radiative model of atomic and ionic excited levels for Hall thruster *Y.-F. Wang*	**A114** Hall Thruster ST-25 designed by Space Electric Thruster Systems (SETS) *O. Petrenko*	**A496** Numerical simulation of plasma discharge in RF ion thruster *R. Rakhimov*
16.00	**A768** Evaluation of Iodine Compatible Hollow Cathode Configurations *S. Thompson*	**A223** Direct Thrust Meas-urement and Plume Characterization of a Porous Electrospray Thruster *C. Ma*	**A762** Stationary Profiles and Axial Mode Oscillations in Hall Thruster *A. Smolyakov*	**A791** Performance Comparison of a 2 kW Hall Thruster with Heaterless Cathodes Mounted on the Outer Pole Piece and on the Thruster Centerline *T. Andreano*	**A905** Analytical and numerical simulation of Ring Cusp Discharge Chamber *F. Cannat*
16.15	**A802** Diagnostic analysis of a 30 A heaterless hollow cathode *A. Daykin-Iliopoulos*	**A296** Experimental Validation of a Dielectric Electrospray Emitter with a Directly Deposited Thin Film Electrode *A. Kimber*	**A846** Proportional Thermal Model for Hall Thrusters with Magnetic Shielding *M. Porto*	**A441** Development Status of 6-kW-class Hall Thrusters at JAXA *I. Funaki*	**A367** Plasma characteristics in the backflow region of ion thruster plumes using kinetic and electron fluid models *N. Nuwal*

	Pulsed Plasma Thrusters	Commercial Propulsion Needs	Global Strategic Invests	Innovative Concepts
	SR4	HS2	SR8	HS3
14.45	**A556** Performance Evaluation and Development of Air Bearing Thrust Measurement System of Surface Arc Thruster *K. Hiraka*	**A456** Progress in Automated System Design by Evolutionary Algo-rithms *M. Ehresmann*	**A753** Application of Solar Electric Propulsion in the Emerging Satellite Servicing Industry *M. Glogowski*	×
15.00	**A616** Development of Pulsed Plasma Thruster for a Pico-Satellite *M. Sammut*	**A826** HEMPT-Strategy to address current and future Space Market *E. Bosch*	**A778** Spacecraft perspective trends and their propulsion systems *A. Sizovi*	**A553** Local Plasma Flow Coupling with Plasma-wave Interaction in Helicon Plasma Thrusters *B. Tian*
15.15	**A899** Fiber-fed Pulsed Plasma Thruster (FPPT) for Small Satellites *D. Carroll*	**A212** The Benefits of Continued Advances in the Propulsive Capability of the Electric GEO Communications Satellite *J. Trescott*	**A780** Compatibility of electric propulsion and spacecraft: general requirements *E. Tverdohlebova*	**A717** Validation of an Equivalent Circuit Model for Rotating Magnetic Field Field-Reversed Configuration Thrusters *J. Woods*
15.30	**A657** A Vacuum Arc Ion Thruster for SmallSat Applications *J. Kolbeck*	**A210** EP orbit raising: environmental effects impact on satellites, modelling and challenges *B. Zitouni*	**A876** Propulsion subsystem for a stand alone interplanetary CubeSat *D. Feili*	×
15.45	**A860** Optical measurements of ablation process of double-cylindrical pulsed plasma thruster *T. Inaba*	**A883** More added value? – an investi-gation on the commercial benefit of different EP technologies for orbital propulsion instancing H2020´s GIESEPP *C. Dietz*	**A275** High power electric propulsion: MARS plus EUROPA - already beyond 2025! *F. Jansen*	×
16.00	**A421** Performance and Efficiency of Electric Solid Propellant in a Pulsed Plasma Thruster *M. Glascock*	**A790** Development of a 100 mN Horizontal Torsion Balance *B. Seifert*	**A607** VENUS - Updates on Technologi-cal Mission Using IHET *D. Lev*	**A176** Effects of magnetic shielding on the performance of Multi-cusped field thruster *P. Hu*
16.15	**A659** Micro-cathode arc thruster improvement by the second MPD stage *D. Zolotukhin*	**A413** Design and testing of a μN - mN torsional thrust balance with wireless microwave power transmission *K. Swar*	**A418** Electric Propulsion for Small Satellites: A Case Study *P. Lascombes*	**A243** Electric Propulsion Pointing Mechanism EPPM for the Spacebus Neo Platform *A. Derntl*

	Material Technology Cathodes, Gimbals	Field Emission / Colloid Thrusters	Hall Thrusters 1	Hall Thrusters 2	Ion Thrusters
	HS6	SR5	SR6	SR7	HS5
16.30	**A890** Characterization of a Fixed-Volume Release System for Initiating an Arc Discharge in a Heaterless Hollow Cathode *R. Ham*	**A471** Development and Characterization of an Ionic Liquid Electrospray Thruster with a Porous Metal Blade Array *X. Liu*	**A264** A thermo-mechanical analysis with the use of tasks in a non-linear formulation for a low-thrust thruster calculations during lifetime prediction with the SPT-50 thruster as an example *O. Olshanskaya*	**A342** Parametric study of 1,5- and 2.5-kW Hall Thrusters with an external discharge zone *A. Lovtsov*	**A529** Study of Ion Thruster Backflow Characteristcs with Neutralization Using Kinetic PIC-DSMC *D. Levinl*
16.45	**A422** The development of the Integrated Thruster Unit ITU100 and ITU140 *A. Zarakovskiy*	**A522** Performance of a Fully Conventionally Machined Liquid-Ion Electrospray Thruster Operated in PIR *M. Natisin*	×	**A392** Laboratory tests of 10.5kW Hall thruster with external layer *A. Shashkov*	×
17.00	**A881** Harmonization of European Mechanisms for Electric Propulsion *M. Toso*	**A787** Reconstructing Electrospray Plume Current Spatial Distributions using Computed Tomography *D. Courtney*	**A681** Status of Research Activities on Electric Propulsion at CIRA *V. Salvatore*	**A740** Performance of the Aurora Low-Power Hall Effect Thruster *J. Sommerville*	×
17.15	**A289** Development and Qualification of an Electric Propulsion Thruster Orientation Mechanism for the Electra GEO satellite *V. Garcia*	**A794** Investigation of Electrospray Plume Composition during Voltage Transients *E. Petro*	**A241** PPS®X00 Hall Thruster Development Status at Safran *J. Vaudolon*	**A910** Performance, Stability, and Wear Characterization of a Sub-Kilowatt Hall Thruster *H. Kamhawi*	**A612** Elegant Approach for solving the Conservation Laws in Global Modelling of Radio-Frequency Ion Thrusters *A. Reeh*
17.30	**A840** Research and development of radio-frequency cathode-neutralizer *P. Smirnov*	**A884** An energy-dispersive mass spectrometer for electrospray propulsion diagnostics *N. Ford*	**A655** SITAEL HT100 Thruster, Full Ground Qualification *T. Misuri*	**A216** Performance of a 100-Watt Radial Scaled Thruster with Anode Layer *A. Olano Garcia*	**A699** Three-dimensional simulation of ion thruster plume-spacecraft interaction using EX-PWS *H. Zheng*
17.45	**A477** CNT-based cold electron source for space applications on nano-satellites *P. Laufer*	**A590** Interaction of Droplets in Electrospray Plumes *M. Davis*	**A825** Development status of SITAEL's 20kW class Hall thruster *T. Andreussi*	**A527** Design and performance test of the BEHT200 low power hall thruster *Y. Hu*	**A491** Studying the formation and neutralization of an ion thruster plume with EP2PLUS *J. Perales-Díaz*

	Pulsed Plasma Thrusters	Commercial Propulsion Needs	Global Strategic Invests	Innovative Concepts
	SR4	HS2	SR8	HS3
16.30	**A662** Experimental Analysis of Cusped Magnetic Field Focusing on Vacuum Arc Thrusters *M. Laterza*	**A784** TIDBIT - Thruster In-Space Diagnostics with Bus Integrated Telemetry *T. Matlock*	×	**A373** Plasma Magneto-Shell Aerocapture for Manned Mars Missions and Planetary Deep Space Orbiters *J. Slough*
16.45	**A798** An investigation of alternative propellants for pulsed plasma thrusters *W. Y. L. Ling*	**A211** Thrusters modelling, propellant choice and plume expansion: openPlumeEP capabilities *B. Zitouni*	×	**A398** Modeling, Simulation and Testing of a Magnetically Enhanced RF Plasma Source for a High Power Electromagnetic Thruster *X. Wen*
17.00	**A554** Ignition Capability of Pulsed Plasma Thruster with Green Liquid Propellant *J. Aoyagi*	**A123** Cryopumping Challenges of EP-Propellants in DLR's Electric Propulsion Test Facility *A. Neumanni*	×	**A547** Electric Propulsion Activities at the UCLA Plasma Space Propulsion Laboratory *R. Wirz*
17.15	**A898** Micro-Cathode Matrix Arc Thrusters- A Modified Approach to Micro-Cathode Arc Thrusters *K. Daniels*	**A796** Development of Propulsion Testing and Integration Facilities at Canon Electronics *K. Masuyama*	×	**A549** Possible electric propulsion schemes based on a combination of RF and DC discharges *I. Zadiriev*
17.30	×	**A656** Inter-Laboratory Comparison: Tests of a single thruster in two different facilities, on two different thrust balances *F. G. Hey*	×	**A564** Experimental Study of Traveling Wave Plasma Acceleration and Optimization of Magnetic Field Structure for Electrodeless RF Plasma Thruster *Y. Oshio*
17.45	×	**A653** University of Michigan's Upgraded Large Vacuum Test Facility *E. Viges*	×	**A572** The Transport Character of the Field Reversed Configuration Plasmoid in the Field Reversed Propulsion Thruster *L. Lijuan*

	Material Technology Cathodes, Gimbals	Field Emission / Colloid Thrusters	Hall Thrusters 1	Hall Thrusters 2	Ion Thrusters
	HS6	SR5	SR6	SR7	HS5
18.00	×	×	**A885** SITAEL'S HT400 Hall-Effect Thruster for Constellation Applications *T. Misuri*	**A410** Mechanism Behind the Dependence of Thrust on Facility Backpressure and Implications on the Operation of the SPT-140 Onboard the Psyche Mission *I. Mikellides*	**A804** Theoretical and Experimental assessment of Ion Extraction phenomena *M. Mallon*
18.15	×	×	×	**A714** Impact of Facility Pressure on the Wear of the NASA HERMeS Hall Thruster *J. Frieman*	**A834** Development of a 3D ion optics modelling code *S. Centola*
18.30	×	×	**A193** The 12.5 kW Hall Effect Rocket with Magnetic Shielding (HERMeS) *R. Hofer*	**A630** Data-driven Models for the Effects of Background Pressure on the Operation of Hall Thrusters *M. Byrne*	**A854** Neutral Density Simulation in the Grid Region of Ion Thrusters using the ffx Ion Optics Code *J. Williams*
18.45	×	×	**A266** A 30-kW Class Magnetically Shielded Nested Hall Thruster *S. Cusson*	**A664** Test Results of ExoTerra's Halo Electric Propulsion Module *M. Vanwoerkom*	×
19.00	×	×	×	**A713** Variation in Ion Acceleration Characteristics of the HERMeS Hall Thruster during Magnetic Optimization *W. Huang*	×
	Session End				

	Pulsed Plasma Thrusters	Commercial Propulsion Needs	Global Strategic Invests	Innovative Concepts
	SR4	HS2	SR8	HS3
18.00	**A321** Experimental Study on Ignition Reliability of Pulsed Plasma Thrusters *X. Liu*	**A847** Improved Pumping Speed of Custom Cryopumps for Electric Propulsion Vacuum Facility *M. Crofton*	×	**A766** Design of an Experiment for Compression and Nozzle Expansion of a Field-Reversed Configuration for Advanced Space Propulsion *P. Turchi*
18.15	**A536** The study on the lifetime of the micro cathode arc thruster *J. Geng*	×	×	**A785** Electromagnetic Propulsion Using Non-Ionized Dipole Gases *M. Micci*
18.30	**A661** Influence of Insulator Geometry on Vacuum Arc Thruster Lifetime *M. Laterza*	×	×	**A848** Low-Field Mode Transitions in a Spiral-Antenna Helicon Thruster *J. Little*
18.45	**A169** Predicting Pulsed Plasma Thruster Performance with Deep Recurrent Networks *P. Shaw*	×	×	**A852** Laboratory demonstration of a bidirectional helicon plasma thruster for space debris removal *K. Takahashi*
19.00	**A893** Pulsed Plasma Acceleration Modeling in Detonation and Deflagration Modes *K. Polzin*	×	×	**A933** Iodine as propellant for electric propulsion: optical measurements of I density and temperature, comparisons to a global model *F. Marmuse*

TUESDAY

	Material Technology Cathodes, Gimbals	Field Emission / Colloid Thrusters	Hall Thrusters 1	Hall Thrusters 2
	HS6	SR5	SR6	SR7
09:00	**A628** Experimental characterization of the attachment length in orificed hollow cathodes *P.-Y. Taunay*	**A213** Quantitative mapping of the mechanisms affecting electrospray thruster lifetime *A. Collins*	**A492** Development of a 5kW Class Hall Thruster *C. Mullins*	**A904** SITAEL's HT5k LL Magnetically-Shielded Hall Thruster Tests *T. Andreussi*
09.15	**A663** Two-Photon Absorption Laser Induce Fluorescence (TALIF) of Neutral Xenon Density in a Barium Oxide Hollow Cathode Plume *T. Wegner*	**A368** Resolving electrospray emission modes using high-speed current measurements *N. Uchizono*	**A140** Development of a 1.5KW High Specific Impulse Magnetic Shielded Hall Thruster *A. Mishra*	**A879** SITAEL's Magnetically Shielded 20 kW Hall Thruster Tests *T. Andreussi*
09.30	**A689** Time-Resolved Electron Density and Temperature Measurements in a Hollow Cathode Discharge by Cavity Enhanced Thomson Scattering *A. Friss*	**A571** Spatially-Resolved Electrospray Plume Current and Mass Flux Measurements and Analysis *A. Thuppul*	**A274** High Throughput 1.5 kW Hall Thruster for Satcoms *S. Zurbach*	**A591** Preliminary tests of HIKHET laboratory model at IPPLM *J. Kurzyna*
09.45	**A760** 5-100 A LaB6 Hollow Cathodes for High-Power Hall Thrusters *G. Becatti*	**A892** Characterization of Electrospray Thruster Electrode Overspray and Backspray *C. Marrese-Reading*	**A901** Development of the High Voltage Hall Accelerator Propulsion System *H. Kamhawi*	**A735** Preliminary Tests of UK90 Hall Thruster with Internal Hollow Cathode *U. Kokal*
10.00	**A427** Mode Transition in a LaB6 Hollow Cathode for Electric Propulsion Systems for Small Satellites *G.-C. Potrivitu*	**A909** Microfluidic and materials improvements in the ion Electrospray Propulsion System *B. Kristinsson*	**A282** Overview of the Ascendant Sub-kW Transcelestial Electric Propulsion System (ASTRAEUS) *R. Conversano*	**A343** Effects of Thrust Noise on Drag-Free and Attitude Control System *K. Cui*
10.15	**A428** Systematic Testing of Improved Designs of Miniaturized LaB6 Hollow Cathodes for Electric Propulsion Systems for CubeSats and Small Satellites *G.-C. Potrivitu*	×	**A283** Development Acceptance Testing of the Thruster Component of the Ascendant Sub-kW Transcelestial Electric Propulsion System (ASTRAEUS) *R. Conversano*	**A377** Mini-CHT powered Formation Flying Mission for Magnetic Reconnection Research in Space *J. Simmonds*
10.30	**A369** Lithium Hollow Cathode for a Very High Isp Interstellar Precursor Ion Thruster *D. Goebel*	×	**A873** Development of a low power HEMP Thruster EVO *R. Heidemann*	**A651** The Application of an Advanced Electric Propulsion System on the NASA Power and Propulsion Element (PPE) *D. Herman*
10.45	**A371** High Current Hollow Cathode for the X3 100-kW Class Nested Hall Thruster *G. Becatti*	×	**A878** HT5k Development Status, Future Activities and Market Opportunities *T. Andreussi*	×
11.00	Conference Tour			

	Ion Thrusters	Pulsed Plasma Thrusters	Innovative Concepts	Power Processing Developments	Thruster Concepts
	HS5	SR4	HS3	SR8	HS2
09:00	**A355** Physics Principles for Optimization of HEMP-thruster using PIC simulations *P. N. Maya*	**A108** Analysis of Distributed Energy Release Characteristics in an Ablative Pulsed Plasma Thruster *L. Yang*	**A361** Directed-Energy Propulsion Architecture for Deep-Space Missions with Characteristic Velocities of Order 100 km/s *J. Polk*	**A110** Hight-efficiency discharge power supply for engine system with Hall Thruster *O. Petrenko*	**A242** Digital Filtering of Electric Thruster Time Domain Radiated Emissions *N. Rongione*
09.15	**A504** Key factors affecting the parameters of inductive RF ion thruster in continuous and pulsed operating regime *E. Kralkina*	**A457** Preparation of space experiment to study ionosphere using pulsed plasma injectors with increased power aboard the ISS *A. Bogatyi*	**A458** Hybrid Electric Propulsion System on the Basis of SPT and PPT *M. Kazeev*	**A187** Study of Operation of Power and Propulsion System based on Closed Brayton Cycle Power Conversion Unit and Electric Propulsion *A. V. Karevsky*	**A521** Direct thrust measurement of a vacuum arc thruster *J. Jarrige*
09.30	**A678** Global model of a magnetized ion thruster with xenon and iodine *R. Lucken*	**A497** Investigation on the Discharge Arc Behaviour of an Asymmetric Electrodes Pulsed Plasma Thruster *Z. Zhang*	**A508** Optimization of Electric Propulsion System Parameters of LEO Spacecrafts *M. Kazeev*	**A270** Electric Propulsion Mission Design with Minimal Solar Cells Radiation Degradation *A. Starchenko*	**A595** Mechanically amplified milli-Newton thrust balance for RF-thrusters *M. Wijnen*
09.45	**A831** Investigation on Alternative Propellants for Gridded Ion Engines *N. Fazio*	**A533** Plume and current-voltage characterization of the micro-Cathode Arc Thruster *Y. Qin*	**A424** Crosscutting High Apogee Refueling Orbital Navigator (CHARON) for Active Debris Removal *J. Slough*	**A190** High Efficiency Auto Resonant Converter Anode Power Supply Design, Development Testing *M. Richards*	**A715** Development of the SPACE Lab Thrust Stand for Millinewton Thrust Measurement *P. Thoreau*
10.00	**A862** Integrated Vlasov-Fully Kinetic PIC Simulations of Plasma Plumes *C. Cui*	**A576** Temporal and Spatial Ion Velocity Distributions of a Short-pulse Coaxial Laser-assisted Pulsed Plasma Thruster *T. Mikami*	**A462** Concept Study of Air-breathing HeliconThrust In an Ultra-low-Orbit *Q. Y. Ren*	**A280** Deep Space Power Processing Unit for the Psyche Mission *S. Malone*	**A578** Self-calibration Laser Induced Fluorescence technic in Electric Propulsion plasma diagnosing *X. Yang*
10.15	**A882** Influence of Hollow Cathode design parameters on Ring Cusp Discharge Chamber performances *F. Cannat*	**A476** PETRUS 2.0 PPT and its CubeSat-size PPU: Testing and Characterization *C. Montag*	**A485** Ultra-low- orbit Spacecraft Long Term Sustained *H. Zhao*	**A346** Designing, Manufacturing and Testing of Power Processing and Control Unit for a 1.5 kW Hall Effect Thruster *S. Neugodnikov*	**A863** Laser ablation plasma diagnostics for electrostatic acceleration *A. Hamada*
10.30	×	×	×	**A409** Design and Implementation of a High Voltage Supply for Gridded Ion Thrusters using model-based control algorithms *C. Roessler*	**A623** Active Wave Injection Diagnostic for Plasma Dispersion Relation Measurements *S. Rojas Mata*
10.45	×	×	×	**A419** REGULUS: Know-How Acquired on Iodine Propellant *D. Pavarin*	**A538** Torsional Balance Thrust Measurement Techniques for Small RF Thrusters *C. Cretel*

WEDNESDAY

	Material Technology Cathodes, Gimbals	Field Emission / Colloid Thrusters	Hall Thrusters 1	Hall Thrusters 2
	HS6	SR5	SR6	SR7
09:00	**A782** Recent Advances in Low-Current Hollow Cathodes at SITAEL *D. Pedrini*	**A139** Dual-Axis Torsional Thrust Stand for Simultaneous Direct Measurement of Thrust and Mass Loss *M. Gilpin*	**A906** Qualification Status of the PPS® 5000 Hall Thruster Unit *O. Duchemin*	**A156** Code-to-Code Verification of Stochastic Models for Electric Propulsion Plume Simulation *S. Araki*
09.15	**A207** Tests of an iodine-fed rf-neutralizer *P. Dietz*	**A226** Investigations into multiple emission sites in porous electrospray thrusters *C. Tacon*	**A673** Qualification status of the EP system for Heinrich Hertz satellite (H2Sat) *S. Ciaralli*	**A157** Unified Framework for Hall-Effect Thruster, Plume, and Spacecraft Charging Models to Assess Spacecraft Integration *S. Araki*
09.30	**A896** Ariane Group 5A Neutralizer qualification status *C. Altmann*	**A445** Development of a Retarding Potential Analyser for Low Density FEEP Thruster Beam Diagnostics *N. S. Mühlich*	**A599** Development and Performance Test of a 50 W-class Hall thruster *D. Lee*	**A222** Long-term Scale Characteristics of Low-frequency Oscillation of Hall Thrusters *L. Wei*
09.45	**A297** Performance Testing of a Microwave ECR Neutralizer for the X-EPT Gridded Ion Thruster for Telecoms Applications *S. Reeve*	**A566** Two-dimensional plasma plume density characterisation of the IFM Nano Thruster *S. Keerl*	×	**A235** Study of Xenon Wall Accommodation Model and Background Flow During Hall Thruster Ground Test *G. Ito*
10.00	**A148** Improving EP device performance and lifetime with plasma-robust surface architectures *C. Huerta*	**A260** MEMS FEEP Thrusters – Miniaturised Liquid Metal Ion Source using Glass Capillaries *M. Tajmar*	**A832** Preliminary design of a low-power Hall Thruster *C. Groll*	**A263** Numerical Investigations of Background Pressure Effects and Channel Erosion in the SPT-140 Hall Thruster for the Psyche Mission *A. Lopez Ortega*
10.15	**A172** LaB6 hollow cathode work function enhancement: insight into the chemical processes *P. Guerrero*	**A362** Development, Production, and Testing of the IFM Nano FEEP Thruster *T. Schönherr*	**A634** Development and Characterization of a Miniature Hall-Effect Thruster using Permanent Magnets *N. Gondol*	**A247** Numerical Simulations of AFRL EP/TEMPEST experiment using the Thermophysics Unified Research Framework (TURF) *L. Brieda*
10.30	**A245** Plasma model and experimental investigation of a hollow cathode neutraliser *A. Gurciullo*	**A675** The IFM Micro FEEP thruster: a modular design for smallsat propulsion *L. Grimaud*	**A375** Miniaturized Cylindrical Hall Thrusters *J. Simmonds*	**A237** Study on Feed System of Iodine Cusped Field Thruster *H. Liu*
10.45	**A301** Hollow cathode thermal modelling and self-consistent plasma solution: two step neutralization modelling *P. Guerrero*	**A686** The ESA Earth Observation Programme activities for the design, development and qualification of the mN-FEEP thruster *L. Massotti*	**A465** Investigation of the possibility to develop competitive small power stationary plasma thruster (SPT) *V. Kim*	**A285** Influence of plume magnetic field on discharge performance of Hall thruster under internal and external cathode position studied by particle-in-cell simulation *X.-F. Cao*

	Ion Thrusters	Resistojets/ Arcjets	Innovative Concepts	Power Processing Developments	Thruster Concepts
	HS5	SR4	HS3	SR8	HS2
09:00	**A356** T7 thruster design and performance *J. Perez Luna*	**A224** Electrostatic Probe Investigation of Very Low Power Arcjet VELARC in IRS and ESA-ESTEC Facilities *J. Skalden*	**A158** Optimum design for the drive-coil of a 500J inductive pulsed plasma thruster and its numerical evaluation *B. Che*	**A423** RF Power Processing for a VASIMR® System *J. Squire*	**A232** Electromagnetic-PIC simulation of an ECR plasma thruster *J. C. Porto*
09.15	**A688** T5 Performance, Industrialisation and Future Applications *P. Randall*	**A122** An Efficient Ionization Method for Pressure Up To Thousands of Pascals *L. Chang*	**A191** Effects of Collisional-Radiative Processes with Relative Drift in Electric Propulsion Devices *R. J. Abrantes*	**A474** Development of a full bridge series resonant radio-frequency generator for optimized RIT operation *J. E. Junker*	**A415** Numerical Model of a Magnetically Enhanced Plasma Thruster *M. Magarotto*
09.30	**A360** Testing of a 50,000-s, Lithium-fueled, Gridded Ion Thruster *J. Brophy*	**A170** The Development and Qualification of the STAR Resistojet System for Telecommunications Applications *F. Romei*	**A248** Electrocoalescence in Ultrasonic Electric Propulsion system *W. He*	**A512** High Voltage Power Supply for T5 Gridded Ion Thruster *M. Blaser*	×
09.45	**A640** HEMPT Ion Thruster Operation with Krypton Propellant *A. Genovese*	**A786** A 17.8-GHz Ammonia Microwave Electrothermal Thruster for CubeSats and Small Satellites *M. Micci*	**A259** Water as an Alternative Propellant for a Next Generation Plasma Propulsion System *A. Schwertheim*	**A567** Design and Manufacturing of Control Unit for low and medium power Hall Effect Thruster *S. Neugodnikov*	**A460** Simulations of magnetized plasma thruster plumes *F. Cichocki*
10.00	**A811** Development and testing of the NPT30 ion iodine thruster *J. Martínez*	**A393** Lifetime Investigations of an Additively Manufactured High-temperature Resistojet Heat Exchanger from Tantalum *M. Robinson*	**A265** Multifluid FRC Formation Modeling with Relative Drift Corrected Collisional-Radiative Processes *R. Lilly*	**A575** Development of High Efficiency Power Processing Unit for Hall Thruster *A. Tsybulnyk*	**A564** Investigation of the Circuit and Ablation Model for a Vacuum Arc Thruster *S. Bai*
10.15	**A383** Development of 50 W class RF gridded ion thruster *J. Shin*	**A403** Failure analysis of endurance tested 316L stainless steel Super High Temperature Additive Manufactured Resistojet (STAR) *C. Ogunlesi*	**A324** Numerical investigation of “Detachment Cone” in the magnetic nozzle *Z. Chen*	**A584** Power Processing Unit Activities at Thales Alenia Space in Belgium *E. Bourguignon*	**A573** Numerical Analysis of Plasma Acceleration Driven by Loop Coil in Electrodeless Thruster *Y. Yamakawa*
10.30	**A446** Development Status of Microwave-ion Thruster M5 for Small and Micro Satellites *K. Zhu*	**A631** Effect of structure characteristics on start-up process of an Arcjet thruster *Y. Shen*	**A330** Numerical Simulations of the Plasma Discharge in an Helicon Plasma Thruster *J. Zhou*	**A696** Flying Capacitor Multilevel Converters for use in the ASTRAEUS Anode Power Supply *A. Barchowsky*	**A647** Optimization of electro-thermal microwave plasma thruster for nanosatellites *S. Ivanov*
10.45	**A900** The Development and Test of a Dual Mode Micro Microwave Gridded Ion Thruster for Orbit Raising and Attitude Keeping *A. Vafabakhsh*	×	**A560** Research on Micro Impulse Measurement Technology for Micro Cathode Arc Thruster *X. Liu*	**A728** RAFAEL's Compact Power Supply Unit (PSU) for an Affordable Electric Propulsion System (EPS) *D. Lev*	

Material Technology Cathodes, Gimbals

HS6

11.00

A331
An Axisymmetric Eulerian-Kinetic Solver for Simulation of Hollow Cathodes
A. R. Vazsonyi

11.15

A452
A Plasma Model for Orificed Hollow Cathodes
M. Panelli

11.30

A914
Validation of a drift diffusion model for a hollow cathode
S. Gabriel

A781
A One-Dimensional model for Hollow Cathode Orifice lifetime prediction
F. Bosi

11.45

12.00

Lunch Break

12.15

13.30

15.00

A783
Numerical modeling and incoherent Thomson scattering measurements of a 5A cathode with LaB6 emitter
L. Garrigues

Field Emission / Colloid Thrusters

SR5

A805
CLIMB: Exploration of the Van Allen Belt by CubeSats
C. Scharlemann

A724
Recent flight data of the IFM Nano Thruster used for LEO orbit raising
D. Krejci

A828
UWE-4: In-orbit characterization of the NanoFEEP propulsion system
A. Kramer

A895
LISA Colloid Microthruster Technology Development Plan and Progress
J. Ziemer

A196
Droplets emission from FEEP and colloids thrusters: modelling of droplets dynamics and interaction with spacecraft body
M. Villemant

Hall Thrusters 1

SR6

A836
Overview of NASA's Solar Electric Propulsion Project
P. Peterson

A779
Development of low-power micro cylindrical hall thruster "SCHT-1"
T. Ikeda

A702
Development of BUSTLab Low Power Hall Thruster for Use at LEO Mini-Satellite Systems
U. Kokal

A856
Small Permanent Magnets Hall Plasma Thruster Development for Micro and Nano Satellites
J. Ferreira

A627
Experimental investigations and performance optimisation of the Halo thruster
S. Masillo

A336
The research of the modified SPT-70 thruster parameters and characteristics
A. Markov

Hall Thrusters 2

SR7

A294
EP plasma plume in orbit: Diagnostics and analysis correlation
J. Laube

A639
Coupling of an all-electric spacecraft with its plasma plume and its environment
S. Hess

A833
Simulation of plasma plume experiments with Hall Thrusters: on-ground chamber effects on measurements and extrapolation to in-flight situation
P. Sarrailh

A858
Thruster Plume and Spacecraft Interaction Analysis by 3D Electrostatic Code for 4.5-kW-Class Hall Thruster
T. Muranaka

A473
Parallel codes using particles decomposition and view factor model methods for the particle in cell-Monte Carlo collision (PIC-MCC) simulation on cylinder hall thruster
R. Pan

Plenary Lecture Audimax
LEO

A318
Coupled Simulation of Two-Dimensional Hybrid Hall Thruster Models
R. Kawashima

Ion Thrusters

HS5

A652
Performance Testing of the X-EPT Microwave ECR Gridded Ion Thruster for Telecoms Applications
D. Hoffman

A143
Development of the Miniature Xenon Ion Thruster with Hollow Cathode Operation
S. Samples

A558
Development of 5 kilo-watts electric propulsion system on Satellite SJ-20
G. Jun

A668
The Analysis of Parameter Sensitivity of Electron backstreaming failure mode for 3-grid system ion thruster
Y. Jia

Resistojets/ Arcjets

SR4

A225
Development Progress of an Adaptable Deorbit System for Satellite Constellations
J. Skalden

A390
Performance Theory and Development of a Resistojet Based Hybrid Electro-Chemical Thruster
G. Coral

A520
Numerical Investigation of Micro-Cathodic Arc Thruster Lifetime using the PIC-DEM Method
L. Brieda

Innovative Concepts

HS3

A633
PIC/fluid/wave simulations of the plasma discharge in an ECR plasma thruster
A. Sánchez-Villar

A174
Design and preliminary experiments of the prototype of a 500J inductive pulsed plasma thruster
X. Li

Power Processing Developments

SR8

A729
Rafael's Power Processing Unit (PPU) for Electric Propulsion Systems
D. Lev

A888
AIRBUS DS PPU qualification status for HET, GIT and New Space Technologies
F. J. Pintó Marín

A913
Development of a High Voltage Power Process Unit for a CubeSat Electrospray Thruster
C. Ma

A930
13kW Advanced Electric Propulsion System Power Processing Unit Development
E. Soendker

A937
Research on a controlled high voltage power supply for Power Processing Unit
Q. Kang

A464
Development of compact high efficiency RF generator for inductive coupled plasma sources
A. Surminskii

Thruster Concepts

HS2

A795
Numerical Simulation and theoretical analysis of Particle Acceleration in Traveling Magnetic Field Thruster
H. S. Kumar

A609
Discrete Boltzmann Modeling of Atmospheric Pressure Plasma Jet
J. Song

A818
Effect of the initial electron distribution function in magnetic nozzle expansions
S. Correyero Plaza

A744
A 3D Numerical Study of Arcjet Thrusters: Effect of Electrode Configuration on Performance of Arcjet thruster
N. Hari Prasad

A198
Electrodeless Helicon Plasma Thruster Employing Additional Electromagnetic Acceleration Method
T. Furukawa

Material Technology Cathodes, Gimbals

HS6

15.15
A865
Comparisons between Particle Simulation using IAT Growth Model and Plume Measurements of LaB6 Hollow Cathode
K. Kubota

15.30
A874
Fluid model of a Hollow Cathode discharge
X. Chen

15.45
A658
Numerical and Experimental Investigation of Different Heater Designs for Lanthanum Hexaboride Hollow Cathodes
U. Kokal

16.00
A144
Porous Materials for Long Life and High Performance Electric Propulsion
G. Li

16.15
A153
Development of Low-Voltage-Driven Propellantless Cathodes with High-Current Density Based on Graphene-Oxide-Semiconductor Structure
R. Furuya

16.30
A214
Radio Frequency Microdischarge Neutralizer
F. Filleul

16.45
×

17.00
×

Field Emission / Colloid Thrusters

SR5

15.15
A317
Uncertainty Quantification of Electrospray Thruster Array Lifetime
B. Jorns

15.30
A526
Colloid Thruster Plume Simulations Using a Particle-Particle Model
J. Wang

15.45
A530
Effect of Aprotic + Protic Mixtures on Electrospray Droplet Fragmentation
D. Levin

16.00
A830
Development of an Electrospray Source Model for Kinetic Plume Modeling
E. Petro

16.15
A559
Study on Performance of Ionic Liquid Electrospray Thruster in Atmosphere and Vacuum Environment
Y. Guo

16.30
A565
Numerical simulation of electrospray thruster extraction for highly conductive propellants
H. Huh

16.45
A788
High-Speed Transient Characterization of the Busek BET-300-P Electrospray Thruster
D. Courtney

17.00
×

Hall Thrusters 1

SR6

15.15
A660
I2HET: Development of an Iodine-Fed Hall Effect Thruster
M. M. Saravia

15.30
A838
Simulation of an Adaptable Hall Thruster
N. Proulx

15.45
A902
Performance, Plume, Stability, and Wear Characterization of Three Alternate Magnetic Field Topologies in the Hall Effect Rocket with Magnetic Shielding
H. Kamhawi

16.00
A637
Characterisation and Performance Comparison of a Low-Power Hall-Effect Thruster and an Advanced Cusp Field Thruster with Multiple Noble Gases
M. Vaupel

16.15
A752
Preliminary Evaluation of Anode-Layer-Type Hall Thruster Performance Using RF Plasma Cathode with Pulsating Boost Chopper Circuit
K. Nagamine

16.30
×

16.45
A563
Impact on Performance and Erosion in Hall Thruster using Argon and Xenon propellant
J. Yamasaki

17.00
×

Hall Thrusters 2

SR7

15.15
A518
Hybrid modeling of the anoumalous transport inside Hall thrusters
A. Alvarez Laguna

15.30
A648
Multiscale Hybrid Modeling of Unconventional Hall Thrusters
M. Laterza

15.45
A358
The impact of the SPT-140D parameters and lifetime characteristics change on its thermal mode
P. Chubov

16.00
A281
Plasma Simulations for the Assessment of Pole Erosion in the Magnetically Shielded Miniature Hall Thruster (MaSMi)
A. Lopez Ortega

16.15
A364
Particle-In-cell / fluid simulations of a Hall effect thruster accounting for plasma wall interactions
W. Villafana

16.30
A478
The Sputtering Mechanism of Keeper Electrode in Hall Thruster
J. Chen

16.45
A534
Numerical Prediction of Wall Erosion Morphology on Hall Thrusters
N. Wu

17.00
×

Session End → Gala Dinner beginning 18.30

Ion Thrusters

HS5

15.15
A680
Surface Modification of Pyrolytic-Graphite Grids for an Ion thruster
Y. Matsunaga

15.30
A722
Uncertainty Quantification of Modeled Electron Backstreaming Failure for the NEXT Ion Thruster
J. Yim

15.45
A827
Endurance Testing of Iodine BIT-3 RF Ion Propulsion System
M. Tsay

16.00
A907
Modeling Ion Optics Erosion in the NEXT Ion Thruster Using the CEX2D and CEX3D Codes
J. Polk

16.15
×

16.30
×

16.45
×

17.00
×

Resistojets/ Arcjets

SR4

15.15
A837
Numerical Rebuilding of Very Low Power Arcjet Thruster VELARC in Test Facilities at IRS and ESA-ESTEC
P. P. Upadhyay

15.30
A562
A Chemically Augmented Arcjet Thruster with Exotic Propellants
M. Tsuchiya

15.45
A703
Effect of adding water to propellant of a DME arcjet thruster
T. Tachibana

16.00
×

16.15
×

16.30
×

16.45
×

17.00
×

Innovative Concepts

HS3

15.15
A178
The Status of the VASIMR(R) Engine Development Program
M. Carter

15.30
A583
Advanced and nanostructured materials for electric propulsion and small satellites
I. Levchenko

15.45
A646
Operation and Performance of a Fully-Integrated ion Electrospray Propulsion System
B. Kristinsson

16.00
A742
Direct Inertial Electrostatic Confinement Propulsion at Low Power Levels
M. Winter

16.15
A761
Experimental demonstration of thrust vectoring magnetic nozzle with multi-axis thrust measurement system
M. Edamoto

16.30
×

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17.00
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Thruster Concepts

HS2

15.15
A537
An Experimental Study of Thrust Dependence on Magnetic Field in an Electrodeless Inductive Plasma Accelerator
A. Tatsuno

15.30
A596
Development and Characterization of the Helicon Plasma Thruster Prototype HPT-03
J. Navarro-Cavallé

15.45
A608
XMET: Testing of an Argon/ Xenon Microwave Electrothermal Thruster
T. Baxter

16.00
A855
Performance improvement of a magnetic nozzle helicon plasma thruster
K. Takahashi

16.15
A867
Cubesat Test Platform for miniaturized electric propulsion system verification campaign
F. Stesina

16.30
A815
Enabling High-Energy Missions with Nanosatellites by Using Ablative Pulsed Plasma Thrusters
P. Gessini

16.45
A920
The operation of a low-power cylindrical Hall thruster with zinc as the propellant
C. Ryan

17.00
A746
On the Performance of Arcjet Thrusters using Numerical Modeling: A case study of Hydrogen as a propellant
D. Akhare

THURSDAY

	Material Technology Cathodes, Gimbals	Commercial Propulsion Needs	Hall Thrusters 1	Hall Thrusters 2
	HS6	SR4	SR6	SR7
09:00	**A249** Comparison of transient behavior in a 20 A hollow cathode in a 9 kW Hall thruster and a stand-alone configuration *M. Georgin*	**A600** Electric Propulsion Developments at Rafael in 2019 *D. Lev*	**A115** Use of Real-Time Spectrum Analysis for EMI Characterization of the SAFRAN PPS5000 Hall Thruster *W. Tighe*	**A487** Oscillation analysis in Hall thrusters with 2D (axial-azimuthal) Particle-In-Cell simulations *T. Charoy*
09.15	**A359** Pulsed Electron Beam Extraction from a Hollow Cathode *B. Karadag*	**A592** The Ariane Group Electric Propulsion Program 2019-2020 *H. Leiter*	**A793** Life Estimation of Hall Thrusters using Multi Spectral Imaging *H. Gole*	**A501** Enhancing Hall Effect Thruster Simulations with Deep Recurrent Networks *P. Shaw*
09.30	**A430** Mechanism Analysis of Cathode Low Frequency Oscillation *Z. Ning*	**A926** Overview of Busek EP Thrusters *V. Hruby*	**A408** Terahertz Time-Domain Spectroscopy as an Electric Propulsion Plasma Diagnostic *N. Brown*	**A732** Data-Driven Modeling for Nonlinear Dynamics of Physical Phenomena in Hall Effect Thrusters *C. Greve*
09.45	**A603** Replacing keeper orifice plate with emissive material: emission mechanisms and impacts on hollow cathode discharge *T. Meng*	×	**A861** Application of Helium Line Intensity Ratio Spectroscopy to Xenon plasma in Penning discharge *H. Sekine*	**A792** Data-Driven Modeling for Nonlinear Dynamics of Physical Phenomena in Hall Effect Thrusters *D. Bilyeu*
10.00	**A604** Applicability of electride materials for hollow cathodes *M. Reitemeyer*	×	**A516** Hall Thruster Plume Measurements of Time Resolved Ion Energy *T. Kerber*	**A579** Analysis of the plasma discharge in a Hall thruster via a hybrid 2D code *P. Fajardo*
10.15	**A649** Ampere-Level C12A7 Cathode Operation with Initial Testing of Heaterless Ignition *M. Mcdonald*	×	**A308** Electron cross-field transport mechanism observed under the azimuthally inhomogeneous neutral supply in a Hall thruster *J. Bak*	**A613** Boundary conditions for a two-dimensional direct kinetic simulation of a Hall thruster *A. Raisanen*
10.30	**A690** Hollow Cathode Technology for Low Power Electric Propulsion Applications *W. Ohlinger*	×	**A449** On-board Plasma Plume Diagnostics for ETS-9 All-electric Satellite *K. Kinefuchi*	**A619** Operation of a Low Power Hall Thruster with a Shielded Magnetically Configuration *L. Garrigues*
10.45	**A723** Hollow Cathode Operation with Time-Varying Currents *J. Polk*	×	**A252** Significant ion acceleration of Xe ions outside the discharge channel in cylindrical Hall thruster plasmas observed by laser induced fluorescence *G. Doh*	**A642** Influence of Magnetic Field Strength on Narrow Channel Hall Thruster Discharge Operating at Very Low Power *I. Kronhaus*

	Ion Thrusters	MPD Thrusters	Innovative / Advanced Propulsion Concepts	Thruster Concepts
	HS5	SR8	HS3	HS2
09:00	**A127** Electric Propulsion Direct-Current Current Transformer (EPDCCT): Design and Experimental Validation *C. Volkmar*	**A493** Magnetic Field and Current Density Probe for Steady State AF-MPD Thrusters *A. Behnke*	**A164** Evaluation of anomalous resistivity in a low power magnetic nozzle *S. Hepner*	**A188** Comparison of waveguide-coupled and coaxial-coupled ECR magnetic-nozzle thruster using a thrust balance *S. Peterschmitt*
09.15	**A287** Non-intrusive measurements of microwave ion thruster by two photon absorption LIF and laser Thomson scattering *R. Tsukizaki*	**A551** Simultaneous Measurement of Cathode Surface Temperature Distribution and Plasma Spatial Distribution in Self-Field MPD Thruster *S. Tauchi*	**A199** Experimental Validation and Performance Measurements of an ECR Thruster Operating on Multiple Propellants *R. Moloney*	**A219** Optimization of a Low Power ECR Thruster Using Pulsed Power and Frequency Mixing Techniques *B. Wachs*
09.30	**A337** Estimation of Erosion Rate for Surface Material on HAYABUSA2 by Measurement of Backflow Ions from 10-cm-class Ion Thruster *T. Muranaka*	**A918** Thrust Performance and Cathode Temperature Evaluation of MW Class Quasi-Steady MPD Thruster *S. Tonooka*	**A261** The SpaceDrive Project – EMDrive Thrust Measurements and Analysis *M. Tajmar*	**A267** Development of the hall effect hollow cathode thruster *L. Chenguang*
09.45	**A348** A novel optical line-ratio method for measuring the electron parameters in the discharge chamber of xenon ion thrusters *X. Zhu*	**A310** The Experimental Performances of the 100kW MPD Thruster with Applied Magnetic Field *Y. Cong*	**A262** The SpaceDrive Project – Overview of Revolutionary Propulsion Efforts at TU Dresden *M. Tajmar*	**A363** Diagnostics and testing facilities for ionic liquid electrospray thrusters at the Air Force Research Laboratory *D. Eckhardt*
10.00	**A396** Optical plasma diagnostics for radio-frequency ion thrusters *B. Nauschütt*	**A314** Cathode Ablation Performance of Applied-Field Magnetoplasmadynamic *G. Wang*	**A271** Plasma Jet Pack (PJP) Technology *A. Blanchet*	**A417** REGULUS: Iodine Fed Plasma Propulsion System for Small Satellites *D. Pavarin*
10.15	**A503** Two-Photon Laser-Induced Fluorescence Diagnostics of a Radiofrequency Ion Thruster: Measurements in Xenon and Krypton *C. Eichhorn*	**A401** Anode Power Deposition in an AF-MPDT with Two Unique Magnetic Field *P. Wu*	**A279** Thruster Performance Results for the 200 kW Peristaltically Driven Plasma Accelerator *J. Slough*	**A498** XMET: Design and early testing of a xenon microwave electrothermal thruster *D. Staab*
10.30	**A525** Development of a Collisional-Radiative Model for Plasma Thruster Optical Diagnostics *M. Celik*	**A544** Design of Water MPD Thruster *A. Kakami*	**A290** Characterisation of a Rotational Thrust Balance for Propellantless Propulsion Concepts Utilizing Magnetic Levitation with Superconductors *O. Neunzig*	**A638** Direct thrust measurements and design upgrade of an ECR thruster operating on water propellant *D. Staab*
10.45	**A611** Evaluation of Faraday Probes towards its Standardisation for Electric Propulsion Testing *Q. Koch*	**A585** Current Advances in Optimization of Operative Regimes of Steady State Applied Field MPD Thrusters *A. Boxberger*	**A292** Influence of cathode grid dimension on discharge characteristics of IEC thruster *Y.-A. Chan*	**A822** Status of HEMPT-NG development programme at Thales Ulm *S. Weis*

	Material Technology Cathodes, Gimbals	Commercial Propulsion Needs	Hall Thrusters 1	Hall Thrusters 2
	HS6	SR4	SR6	SR7
11.00	**A776** Characterization of a 100 A-class LaB_6 hollow cathode for high-power Hall thrusters *S. Mazouffre*	×	**A246** Hall Thruster Near-Field Plume Characterization Through Optical Emission Spectroscopy *M. Nakles*	**A720** Numerical studies of the ExB electron drift instability in Hall thrusters *F. Taccogna*
11.15	**A845** Total Sputter Yield Characterization of Various Spacecraft Materials *J. A. Young*	×	**A515** Development and Validation of a Time-Resolved Ion Energy Distribution Diagnostic *M. Baird*	**A437** 3D simulation of rotating spoke in a wall-less Hall thruster *K. Matyash*
11.30	**A929** Additively Manufactured Hollow Cathode Keepers with Integral Radiation Shielding *M. S. Mcdonald*	×	**A734** HK40 Hall Thruster Plume Plasma Measurements with Retarding Potential Analyzer, Faraday Probe and Langmuir Probe *U. Kokal*	**A347** Study of the Electron Cyclotron Drift Instability inside Hall Effect Thrusters with a fluid code *V. Joncquieres*
11.45	**A155** Onset criteria for the plume mode oscillation in hollow cathodes *M. Georgin*	×	**A387** Study of two different discharge modes in Hall thruster *I. Khmelevskoi*	**A726** Development of 1D Magneto-static Two-Fluid Plasma Simulation of a Hall Effect Thruster *R. Sahu*
12.00	**A667** The neutral gas properties in orifice hollow cathode before its ignition *Y. Jia*	Lunch Break & Poster Session		
14.00	**Plenary Lecture** BEPI Colombo — Audimax			
15.00	**A823** BEPI- Colombo Electric Propulsion in Mercury *R. Velasco Valencia*	×	**A841** Non-intrusive Characterization of the Wear of the HERMeS Thruster Using Optical Emission Spectroscopy *T. Gray*	**A733** Coupling Non-Maxwellian View Factor Model to Octree Based Particle VDF Compression for Accelerated Spacecraft-Plume Simulation *R. Martin*
15.15	**A305** BepiColombo - Solar Electric Propulsion System Operations for the Transit to Mercury *C. Steiger*	×	**A932** Internal Probe Studies of a Low Voltage Hall Thruster *J. L. Ross*	**A880** Particle-In-Cell model of the dynamic of the electrons between the two walls of Hall thrusters including realistic secondary electron emission data *M. Villemant*
15.30	**A606** BepiColombo – The Mercury Transfer Module *H. Gray*	×	**A384** Incoherent Thomson scattering investigations of a low-power Hall thruster in standard and magnetically-shielded configurations *B. Vincent*	**A215** Numerical solutions of Density Gradients Instability in a Hall Thruster Plasmas *S. Singh*

	Ion Thrusters	MPD Thrusters	Innovative / Advanced Propulsion Concepts	Thruster Concepts
	HS5	SR8	HS3	HS2
11.00	**A618** Test Facility for EMC-Characterization of Electric Thrusters in Operation using an evacuated Reverberation Chamber *R. Thüringer*	**A588** Experimental study of the discharge characteristic in AF-MPDT ignition *Y. Wang*	**A333** High-Specific-Impulse Operation in Diverging Magnetic Field Electrostatic Thrusters with Argon Propellant *D. Ichihara*	**A875** H2020 MINOTOR: Magnetic Nozzle Electron Cyclotron Resonance Thruster *D. Packan*
11.15	**A738** Determination of the Beam Divergence of a Gridded Ion Thruster Using the AEPD Platform *F. Scholze*	**A759** Characterization and Improvement of Thrust Balance for High Power Applied Field MPD Thrusters *G. Herdrich*	**A382** Metallic Ion Thruster using Magnetron E-Beam bombardment *K.-Y. Chen*	**A897** HiperLoc-EP: A new approach for SmallSats Electric Propulsion *J. Stark*
11.30	**A777** Planar probe array for bidimensional mapping of the ion flux profile of a miniaturized ion thruster *L. Habl*	×	**A385** Thrust Generation in Electrostatic-Magnetic-Hybrid Plasma Thruster *A. Sasoh*	**A941** Development of the Xenon Cold Gas Thruster to Support All-Electric Propulsion Missions *I. Johnson*
11.45	**A167** Near Field Probe Measurements in the Plume of a NEXT Ion Thruster *N. Arthur*	×	**A475** Design and Performance Test of a RF Plasma Bridge Neutralizer *D. Spemann*	×
12.00	Lunch Break & Poster Session			
14.00				
15.00		**A195** A Novel Laser Ablation Magneto-plasmadynamic Thruster *Y. Zhang*	**A488** Inductive Plasma Thruster (IPT) for an Atmosphere-Breathing Electric Propulsion System: design and set in operation *F. Romano*	**A467** Performance Analysis of the Capacitively Coupled Radio Frequency Thruster *A. Quraishi*
15.15	**A175** Design and Experimental Study of an Miniature Ion Thruster *J. X. Ren*	**A313** Development of High Power Magnetoplasmadynamic Thrusters in BICE and Beihang University *Y. Li*	**A500** Review of Dualmode/Multimode Space Propulsion *J. Rovey*	**A577** Proposal and Performance Evaluation of Microwave-Driven In-Tube Accelerator Concept *M. Takahashi*
15.30	**A238** Preparation of Space Experiment with Electric Propulsion System Based on Radio-Frequency Ion Thruster aboard the International Space Station *R. Akhmetzhanov*	**A542** Applied-Field MPD Thruster with High Current Heater-less Hollow Cathode *J. Yamasaki*	**A552** Interaction of Ultraviolet Light-emitting Diodes and Solid Polymers for Micropropulsion Applications *H. Horisawa*	**A594** Indirect electrothermal acceleration of a cold gas jet through interaction of an arcjet exhaust flow for space propulsion applications *Y. Arai*

BepiColombo

HS6

15.45

A615
BepiColombo – MEPS commissioning activities and T6 ion thruster performance during early mission operations
P. Randall

16.00

A824
BepiColombo – A mission overview
N. Wallace

16.15

A494
BepiColombo – MTM and MEPS Integration and Verification
K. Kempkens

16.30

A586
BepiColombo - Solar Electric Propulsion System Test and Qualification Approach
S. Clark

16.45

A770
BepiColombo Solar Electric Propulsion Plasma-Spacecraft Interactions: Comparison of Flight Data with Numerical Modelling
F. Filleul

17.00

17.15

17.30

17.45

Commercial Propulsion Needs

SR4

Hall Thrusters 1

SR6

A617
Characterization and performance measurements of 40 W-class and 100 W-class Hall thrusters
T. Hallouin

A528
Development Efforts on a Laser Thomson Scattering Diagnostic for Electric Propulsion Applications
T. Matlock

A598
Experimental Study on the Influence of Magnetic Field on the Performance of Low-power Hall Thrusters
X. Yi

A338
Design and experimental research of a micro-newton cusped field thruster
M. Zeng

A741
Erosion and Lifetime of the Aurora Low-Power Hall Effect Thruster
J. Makela

A298
Pole Erosion Measurements for the Development Model of the Magnetically Shielded Miniature Hall Thruster (MaSMi-DM)
R. Lobbia

A209
Hall Thruster Erosion Measurement by Time-Resolved Cavity-Ring Down Spectroscopy
Y. Egawa

A332
Numerical simulation and experimental research on low power Hall thruster with long life
Y. Ding

Hall Thrusters 2

SR7

A349
Microinstabilities and rotating spokes in the near-anode region of a Hall thruster
J.-P. Boeuf

A582
Experimental characterization and modeling of ID-HALL, a double-stage Hall thruster with an inductive ionization stage
Á. Martín Ortega

A447
Performance Evaluation of a 100-W Class Hall Thruster
H. Watanabe

A816
Scaling of spoke rotation frequency within an ExB Discharge
A. Powis

A352
Neutral gas instabilities in Hall thrusters, Part I: Measurements
E. Dale

A432
Driving Low Frequency Oscillations in Hall Thruster
Y. Raitses

A889
Gradient-drift instability as an origin of spokes in Hall thrusters
N. Marusov

Ion Thrusters

HS5

A239
Atmospheric Ramjet Thrust Unit on the Base of High-frequency Ion Thruster
M. Suvorov

A240
Characteristics of Radio-Frequency Ion Thruster with an Additional Magnetic Field in the Ionization Area
V. Kozhevnikov

A339
Ring Cusp Ion Thruster IT-200PM
A. Lovtsov

A574
Test Campaign on the novel Variable Isp Radio Frequency Mini Ion Engine
M. Smirnova

A625
Status of HEMPT Electric Propulsion Flight Hardware for Heinrich Hertz Satellite
A. Lazurenko

A797
Exprimental studies on the effect of the magnetic field and the electrical potential inside the water ion thruster
Y. Ataka

A806
A Nouvelle Neutralization Concept for RIT-µX Miniaturized Radio Frequency Ion Thruster Systems
H. Leiter

A808
The RIT 2X High Performance Ion Thruster System Qualification Program
J.-P. Porst

A842
Charge State Thrust Correction Factor for NEXT: DART Mission
M. Crofton

MPD Thrusters

SR8

A872
Development of a 10-30 kW Augmented Field MPD Thruster at SITAEL
A. Kitaeva

A450
Performance of Applied Field MPD Thruster with Various Propellants
S. Ide

A669
Thrust Evaluation of a Small-seized SF-MPD Thruster
K. Ueno

A870
Plasma Plume Characteristics of Cluster Operation of Self-Field Magnetoplasmadynamic Thruster
Y. Murayama

A921
Traveling Wave Thruster System Development
D. Cope

A329
Research on the 500kW Class Superconducting Strong Magnetic Field High Power Magnetoplasmadynamic Thruster Technology
C. Zhou

A801
Business Cases and System Architecture for Superconductor-based Applied Field Magneto Plasma Dynamic Thrusters
M. La Rosa Betancourt

Innovative / Advanced Propulsion Concepts

HS3

A605
Hybrid Electric Propulsion System based on Water Electrolysis
N. Harmansa

A621
Advanced Cusp Field Thruster with a 3D-printed discharge channel - Performance with Iodine and Xenon
M. Vaupel

A645
100 kW Nested Hall Thruster High Power System Demonstration
S. Shark

A693
100kW Nested Hall Thruster System Development
J. Jackson

A692
13kW Advanced Electric Propulsion Flight System Development and Qualification
J. Jackson

A712
The SpaceDrive Project – Progress in the Investigation of the Mach-Effect-Thruster Experiment
M. Monette

A774
Development of a deployable vacuum arc thruster system for the post-mission disposal of micro/nano satellites
M. Kim

A886
Development Roadmap of SITAEL's RAM-EP System
T. Andreussi

Thruster Concepts

HS2

A610
Informing the design of pure-ion electrospray thrusters via simulation of the leaky-dielectric model with charge evaporation
X. Gallud Cidoncha

A643
Physics and performance of the Alternative Low Power Hybrid Ion Engine (ALPHIE) for space propulsion
J. González

A775
Azimuthal Induced Current Formation and Ion Acceleration in an Inductive Radiofrequency Plasma Thruster
H. Sekine

A829
Two-dimensional Full Particle-In-Cell Simulation of Magnetic Sails in Formation Flight
A. Wada

A903
An experimental revisit of plasma phenomena on Helicon Plasma Thrusters
J. Navarro Cavalle

A931
Development of Dielectrophoretic Force Feeding Subsystem for Liquid Pulsed Plasma Thruster
C. Dobranszki

A365
RF Power - Plasma Coupling Experimental Results in a Helicon Plasma Thruster Prototype
V. Gómez

A940
A thruster using magnetic reconnection to create a high-speed plasma jet
S. Bathgate

Material Technology Cathodes, Gimbals

HS6

Commercial Propulsion Needs

SR4

Hall Thrusters 1

SR6

18.00

A341
A 2000 Hours Life Test of a 5 kW Multi-mode High Specific Impulse Hall Thruster HEP-140MF
W. Mao

18.15

A749
Prediction of liner erosion and life estimation of Stationary Plasma Thrusters using Machine Learning
S. Bhat

18.30

18.45

Hall Thrusters 2

SR7

A354
Neutral gas instabilities in Hall thrusters, Part II: Theory
E. Dale

A632
Influence of double-stage operation on breathing oscillations and rotating spokes in the ID-HALL thruster
A. Guglielmi

A433
Use of electrostatic probes for characterization of the electron cross-field current in ExB plasmas
Y. Raitses

A323
Experimental study on the effect of propellant asymmetrical distribution on plasma potential distribution in a Hall effect thruster
M. Ding

19.00 Session End

Ion Thrusters

HS5

A844
Deposition Rate Measurements in NEXT Ion Engine Plume for DART Mission
J. Young

A853
NEXT Single String Integration Tests In Support of the Double Asteroid Redirection Test Mission
R. Thomas

A859
Experimental Characterization of the Microwave-Discharge Water Ion Thruster for CubeSats
Y. Nakagawa

A928
Arclight: a plug-in gridded ion propulsion system for small satellites
P. Bauer

MPD Thrusters

SR8

Innovative / Advanced Propulsion Concepts

HS3

A293
Back-vacuum Retarding Potential Analyzer for Investigation of IEC plasma properties
Y.-A. Chan

A434
Beam Plasma Expansion of a Helicon Plasma Source
Z. Zhang

A448
Modeling and Optical Diagnostics of Iodine Fed Helicon Type Thrusters by a Detailed Global Model (DGM)
K. Katsonis

A682
A Detailed Global Model for Modeling and Optical Diagnostics of Low Power Propulsion Devices Fed by CO2
C. Berenguer

Thruster Concepts

HS2

FRIDAY

	Hall Thrusters	Ion Thrusters	Propellant Storage / Feed Systems	Mission	Diagnostic
	SR7	HS5	SR5	HS2	SR6
09:00	**A665** Plasma fluctuations measurements in a Hall Thruster *N. Yamamoto*	**A145** Radio-frequency biasing of ion thruster grids *T. Lafleur*	**A601** Innovative Xenon/Krypton FMS (Feed Management System) for Electric Propulsion *P. Barbier*	**A192** Development of the Psyche Mission for NASA's Discovery Program *D. Oh*	**A773** ESA Propulsion Laboratory *E. Bosch Borràs*
09.15	**A687** Axial-azimuthal high-frequency instability modes in a Hall thruster fluid model *E. Bello-Benítez*		**A871** Simulation And Experimental Study on Xeon Mass Flow Regulating Characteristics of the Proportional Valve Based on Unimorph Ring-Shaped Piezoelectric Actuator *X. Wang*	**A244** Electric Propulsion for the Psyche Mission *S. Snyder*	**A374** Three-dimensional Vector Measurement of EP Propellant Flow within a Vacuum Chamber *Y. Nakayama*
09.30	**A454** Effect of magnetic field configuration on discharge characteristics in permanent magnet thrusters with cusped field *S. Liang*	**A507** A global performance model of Gridded Ion Thrusters *E. Ahedo Galilea*	**A400** Development of Porous-Metal-Restrictor Based Xenon Flow Control Modules *G. Hang*	**A654** Sitael HT100 Missions: uHETSAt and PLATiNO *T. Misuri*	**A517** In-situ microscopy of ion-induced erosion of plasma-facing surfaces *A. Ottaviano*
09.45	**A472** SPT Phenomenology *V. Kulygin*	**A908** Performance Assessment of a Micro- Gridded Ion Thruster Design *P. Harte*	**A442** Integration and Functional Test Results of Xenon Feed Unit for Electric Propulsion Subsystem *Y. Yurttas*	**A138** Status Update on the Electric Propulsion Subsystem of TURKSAT6A Communication Satellite *B. C. Aydin*	**A258** Thrust measurements using plasma pressure measurements in the plume: a feasibility study *P.-Q. Elias*
10.00	**A479** Predicting secondary electron emission rate in Hall Effect Thrusters *A. Tavant*	×	**A541** A Novel Miniature Xenon Feeding Module for Hall Electric Thruster *C. Guan*	**A923** Final Operations of the Dawn Ion Propulsion System andthe Successful Conclusion of the Dawn Mission *C. E. Garner*	**A887** Recent Advances in Plasma Diagnostics at IRS *G. Herdrich*
10.15	**A514** Enhancing thrust by ion-neutral collisions and by oscillating EM fields *A. Fruchtman*	×	**A891** Towards a Microfluidic Flow Control Unit for HEMP Thrusters *J. Haderspeck*	**A429** The Comet Astrobiology Exploration Sample Return (CAESAR) Mission *M. Sekerak*	**A345** Development of a Flight Electric Propulsion Diagnostic Package (EPDP) for EP Satellite Platforms *T. Trottenberg*
10.30	**A523** Effects of large scale structures on anomalous transport in PIC simulations of Electron Cyclotron Drift Instability in Hall thrusters *A. Smolyakov*	×	**A917** Qualification Program of a Composite Overwrapped Xenon Propellant Tank for a GEO Satellite Mission *S. Ontaç*	**A927** Mars Sample Return - Earth Return Orbiter: ESAs next Interplanetary Electric Propulsion Mission Concept *O. Sutherland*	×

	Hall Thrusters	Mission
	SR7	HS2
10.45	**A543** Towards Predictive Kinetic Simulations of Plasma Thrusters *I. Kaganovich*	**A411** Electric Propulsion Characterisation for a Stand-Alone Mars CubeSat *K. V. Mani*
11.00	**A545** Fluid modeling of gradient-drift turbulence and transport in ExB plasmas *A. Smolyakov*	**A727** Microsatellite Electric Propulsion System (MEPS) Project Status in 2019 *D. Lev*
11.15	**A691** New insights into electron transport due to azimuthal drift in a Hall effect thruster *K. Hara*	×
11.30	**A569** Assessment of the thermodynamic and fluid approximations for electrons in plasma thruster plumes *Y. Hu*	×
11.45	**A304** Characteristic Transient Phenomena of Hall Effect Thrusters *A. Komarov*	×
12.00	**A758** Plasma instabilities in cross-field configuration: an analysis of the relevance of different modes for electron transport *S. Tsikata*	×
12.15	**A843** Experimental Correlation between Anomalous Electron Collision Frequency and Plasma Turbulence in a Hall Effect Thruster *Z. Brown*	×
12.30	**A718** Investigation of cross-field electron transport in a 100-W class Hall Thruster using a full particle-in-cell simulation *S. Cho*	×
12.45	**A593** Simulation of radial electron dynamics in a Hall effect thruster *A. Domínguez-Vazquez*	×
13.00	Technical Visits	

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