

ISES（国際太陽エネルギー学会） Solar World Congress（SWC2021）参加報告

日本太陽エネルギー学会 理事・国際交流委員会 副委員長
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2021年10月25日（月）から29日（金）の5日間に渡って開催された国際太陽エネルギー学会 ISES（International Solar Energy Society）¹主催の国際会議 Solar World Congress（SWC2021）²に参加する機会がありましたので、その参加報告をしたいと思います。

この ISES Solar World Congress（SWC）は、

1954年に設立された ISES（国際太陽エネルギー学会）が、1970年代からほぼ隔年で開催しており、国際的なネットワークとして研究コミュニティ、産業界、政治家との間のコミュニケーションを維持することを目的としています。表1に示すように初回はオーストラリアのメルボルンで開催され、日本でも、1989年に神戸で開催されています（参加者54か国700名、口頭発表450件、ポスター150件）。



表1 過去のSWC開催年および開催地（出所：ISES）

Year	City, Country	Year	City, Country
1970	Melbourne, Australia	1997	Taejon, South Korea
1971	Greenbelt, USA	1999	Jerusalem, Israel
1973	Paris, France	2000	Mexico City, Mexico ¹
1975	Los Angeles, USA	2001	Adelaide, Australia
1977	New Delhi, India (held January 1978)	2003	Göteborg, Sweden
1979	Atlanta, USA	2005	Orlando, USA
1981	Brighton, UK	2007	Beijing, China
1983	Perth, Australia	2009	Johannesburg, South Africa
1985	Montreal, Canada	2011	Kassel, Germany
1987	Hamburg, Germany	2013	Cancun, Mexico
1989	Kobe, Japan	2015	Daegu, South Korea
1991	Denver, USA	2017	Abu Dhabi, UAE
1993	Budapest, Hungary	2019	Santiago, Chile
1995	Harare, Zimbabwe		

前回のSWC2019はチリのサンチャゴでリアルに開催されましたが、今回のSWC2021は、新型コロナウイルス(COVID-19)の感染拡大のため完全オンラインで開催され、表2のとおり約40か国から約200名の参加者で、2021年10月25日から29日まで5日間に渡って開催されました。IEA(国際エネルギー機関)のSolar Heating & Cooling Programme (IEA SHC)が共催をしており、ISRSS-14(14th International Symposium on Renewable Energy Education)が併催されています。

なお、2020年が最初のSWC開催から50周年にあたることから“Solar World Congress at 50(SWC50)”と題したバーチャルイベントを2020年12月から2021年11月にかけて開催しています³。合わせて、記念誌として“The Century of Solar – Stories and Visions of Renewable Energy”をオンラインで発行すると共に、“ISES Solar Energy Museum”をオンライン上にオープンしています。

SWC2021の開催にあたり、会議議長のDr. Dave Rennéは、会議の目的を「太陽エネルギー技術の発展を紹介すると共に促進し、再生可能エネルギー100%社会の実現に向けた太陽エネルギーの役割の重要性に対する認識を広めること」と宣言しています。会議のプログラムは、とても多岐に渡り、再生可能エネルギー100%を目指す上での太陽エネルギー関連技術の役割に焦点を当てていますが、特に太陽熱などの熱分野にも焦点を当てています。全体セッション(11セッション)、11分野のテーマ毎のキーノートセッション(14セッション)と発表論文に関するテクニカルセッション(口頭発表150件、ポスター発表90件)全32セッション、フォーラム(6セッション)が全てオンラインで開催されました。全体セッションやキーノートセッション、フォー

ラムについては、Zoomウェビナーを使い、参加者は録画の視聴も可能。発表論文の口頭発表は、事前に録画されていていつでも視聴でき、ポスターもオンラインで閲覧できるとともに、オンラインでの発表も行われました。オンライン国際会議のシステム全体は、オンラインイベントのプラットフォームを使い、インタラクティブな直観的な操作が可能で、運営も比較的スムーズでした。

5日間に渡るSWC2021のプログラム全体は以下の12のカテゴリーから構成されています。プログラム全体の進行表を図1に示します。

1. Open Ceremony (オープニング): 会議議長挨拶, 全体進行他
2. Plenary Session (全体セッション)
3. Keynotes (キーノート・セッション)
4. Forums (フォーラム)
5. Workshop (ワークショップ)
6. CBC Special Event (特別イベント)
7. Meet the Experts - Solar Speed Dating (エキスパートとのオンライン交流会)
8. SWC Masters Course (大学院生のためのコース)
9. ISREE-14: 第14回再生可能エネルギー教育国際シンポジウム
10. Congress Themes and Topics (テクニカル・セッション) 論文発表(口頭およびポスター)
11. Networking Event: Wonderを使ったオンライン交流会
12. Closing Ceremony(クロージング): 各セッションのレビュー, 次回開催地の紹介

開催初日のオープニングに始まり、全体セッションでは、再生可能エネルギー100%への現状と展望や技術的な展望、政策課題や金融メカニズム、再エ

表2 SWC2021 国別参加者数 (全参加者数 約200名)

出所 参加者リストから筆者集計

Germany	40	Sweden	5	Netherlands	2	Qatar	1	Vietnam	1
Spain	21	Norway	5	Nigeria	2	Iran	1		
USA	14	Peru	5	Mexico	2	Cuba	1		
Chile	11	UK	4	Israel	2	Croatia	1		
Australia	10	Denmark	4	New Zealand	1	Ecuador	1		
China	8	Austria	3	Poland	1	Bangladesh	1		
Italy	7	Japan	3	Brazil	1	Ethiopia	1		
Switzerland	6	Canada	3	Belgium	1	South Africa	1		
Uruguay	6	Greece	3	Iraq	1	Colombia	1		
France	5	India	2	Turkey	1	Pakistan	1		

ネ業界からの様々な発言があり、ISES 賞の受賞式や記念講演 (Dr. Dave Renné) などもありました。キーノート・セッションでは 11 分野のキーワード (PV 技術, ソーラー建築, 100% 再エネ社会, 系統統合化, 太陽熱 (SHC) 技術, 次世代 PV, 熱分野エネルギー効率化, 太陽エネルギー資源, 熱エネルギー貯蔵 集光太陽熱システム, C-Si 太陽光など) に沿った議論が行われました。個別テーマに関するフォーラムでは、大規模エネルギー貯蔵, エネルギー転換における女性の活躍, 太陽資源ハンドブック, 国際データなどが議論されています。テクニカル・セ

ションでは、11 の分野毎にオンラインのセッションが 5 日間に渡り平行で開催され、口頭発表の録画およびオンラインのポスターと共に、オンラインのセッションが行われました (表 3)。

クロージングでは、2023 年 10 月に開催予定の次の SWC2023 の開催地としてインドのニューデリーが発表され、主要な団体の参加者代表からクロージングのメッセージがありました (図 2)。



SOLAR WORLD CONGRESS
VIRTUAL CONFERENCE
25-29 OCTOBER 2021

Preliminary Programme

Time	Monday - 25 October				Tuesday - 26 October				Wednesday - 27 October				Thursday - 28 October				Friday - 29 October				Time				
(CEST)	Track 1	Track 2	Track 3	Track 4	Track 1	Track 2	Track 3	Track 4	Track 1	Track 2	Track 3	Track 4	Track 1	Track 2	Track 3	Track 4	Track 1	Track 2	Track 3	Track 4	(CEST)				
07:30	Helpdesk open																				07:30				
08:00	Opening Ceremony																				08:00				
08:30	Viewing of recorded technical presentations and posters				High Level Plenary - Status and Trends, Major Challenges and Pathways to 100% RE				Technology Overview - How Technology Innovation is Leading the Energy Transformation				Industry Roundtable #1: The Key Roles of Renewable Energy Enterprises - Both Large and Small				Industry Roundtable #2: How Industry Associations Are Influencing and Accelerating the Transformation				08:30				
09:00	Forum: Mass Storage to Support 100% Renewable Energy				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				09:00				
09:30	Viewing of recorded technical presentations and posters				Keynote 3 SHC Technologies				Keynote 4 100% RE World				Keynote 7 Solar Resources				Keynote 11 Grid Integration 1				Keynote 12 Solar concentration systems and hybrid concepts				09:30
10:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				10:00				
10:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				10:30				
11:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				11:00				
11:30	Viewing of recorded technical presentations and posters				Keynote 13 Solar resources, HTF and solar chemistry				Keynote 14 C-Si Photovoltaics				Keynote 15 Solar Resource Assessment				Keynote 16 Solar Resource Assessment				11:30				
12:00	Viewing of recorded technical presentations and posters				Keynote 17 RE & Efficient Heating and Cooling Systems				Keynote 18 RE & Efficient Heating and Cooling Systems				Keynote 19 RE & Efficient Heating and Cooling Systems				Keynote 20 RE & Efficient Heating and Cooling Systems				12:00				
12:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				12:30				
13:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				13:00				
13:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				13:30				
14:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				14:00				
14:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				14:30				
15:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				15:00				
15:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				15:30				
16:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				16:00				
16:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				16:30				
17:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				17:00				
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18:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				18:00				
18:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				18:30				
19:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				19:00				
19:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				19:30				
20:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				20:00				
20:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				20:30				
21:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				21:00				
21:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				21:30				
22:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				22:00				
22:30	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				22:30				
23:00	Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				Viewing of recorded technical presentations and posters				23:00				

図 1 SWC2021 全体進行表 (出所: ISES)

表 3 SWC2021 の発表論文の分野毎の発表数

No.	分野	口頭発表	ポスター
1	Perspectives for a 100% RE World	9	5
2	c-Si Photovoltaics	5	2
3	Other PV Technologies	3	5
4	Innovative PV Deployment	9	4
5	Solar Thermal Electricity and Fuel Production	9	9
6	Grid Integration	13	2
7	Solar Heating and Cooling Technologies	23	20
8	Renewable and Efficient Heating and Cooling Systems	24	12
9	Thermal Energy Storage	18	9
10	Solar Resource Assessment and Energy Meteorology	21	13
11	Solar Buildings and Urban Design	16	10

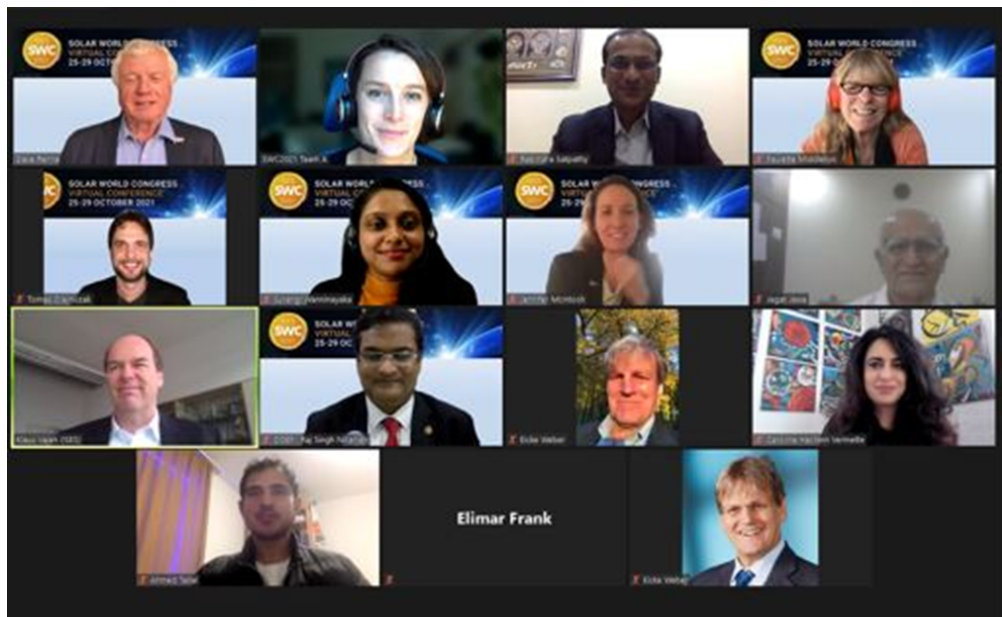


図2 SWC2021 Closing Ceremony のオンライン画面（出所：ISES ホームページ）

脚注

- 1 ISES（International Solar Energy Society）
<https://www.ises.org/home>
- 2 SWC2021 <https://www.swc2021.org/>
- 3 SWC50 <https://swc50.org/>