

International CCMC-LWS Working Meeting

3 3D CME **A** aurora **C** CME Arrival **B** coffee break **D** dB/dt **F** Flares **G** Geo **N** Geo Indices **I** IAIA
Z IMF Bz **H** Ionosphere **M** magnetopause **O** Open **P** Plenary **R** Radiation **S** SEPs **1** SH **L** Solar-Helio
E Solar Indices **T** tracking progress

APRIL 3 • MONDAY

8:00am – 9:00am	B Breakfast	Salons II & III (convention center)
9:00am – 9:05am	P Welcome & Introduction <i>Speaker: Masha Kuznetsova</i> <i>Chairs: Alexa Halford, Barbara Thompson</i>	Salons II & III (convention center)
9:05am – 9:20am	P NASA Heliophysics View of Model Validation <i>Speaker: Steve Clarke</i>	Salons II & III (convention center)
9:20am – 9:35am	P NASA LWS Program Metrics Needs <i>Speaker: Elsayed Talaat</i>	Salons II & III (convention center)
9:35am – 9:50am	P NSF view of Metrics and Validation <i>Speaker: Mike Wiltberger</i>	Salons II & III (convention center)
9:50am – 10:05am	P Metrics For Addressing SWPC End User Needs <i>Speaker: Howard Singer</i>	Salons II & III (convention center)
10:05am – 10:20am	P Metrics For Addressing UK Met Office End User Needs <i>Speaker: Suzy Bingham</i>	Salons II & III (convention center)
10:20am – 10:35am	P Metrics For Addressing ESA SSA End User Needs <i>Speaker: Alexi Glover</i>	Salons II & III (convention center)
10:35am – 10:50am	P Metrics For Addressing Satellite Operator User Needs <i>Speaker: Paul O'Brien</i>	Salons II & III (convention center)
10:50am – 11:20am	B Coffee Break	Convention Center
11:20am – 11:50am	P The NASA Applied Sciences Program (NASA HQ Earth Science Division) <i>Speaker: Lawrence Friedl</i>	Salons II & III (convention center)
11:50am – 12:00pm	P Panel Introduction: The NASA Living With a Star GIC Working Group: Science, Engineering and Applications Readiness <i>Speaker: Antti Pulkkinen</i>	Salons II & III (convention center)
12:00pm – 1:00pm	P Panel: Quantifying Scientific Progress <i>Panelists: speakers above</i>	Salons II & III (convention center)
1:00pm – 3:00pm	B Lunch (on own)	.
2:00pm – 3:00pm	T Assessment of Understanding and Quantifying Progress A Discussion/tutorial on what is an ARL	Martinique (main building)
3:00pm – 4:15pm	3 Joint session: IMF Bz; CME Arrival Time & Impact; and 3D CME kinematics and topology <ul style="list-style-type: none"> • Where each team stands and what they want to achieve this week (10 min per team) • User needs (forecasting) - Rob Steenburgh (NOAA/SWPC) • Metrics needs from a scientific point of view • Goals for each team, discuss with participants 	Salons II & III (convention center)
3:00pm – 4:15pm	A Auroral precipitation and high latitude ionosphere electrodynamics <i>Speakers:</i> Robert Robinson - AMPERE Yongliang Zhang - GUVI Ray Walker - UCLA Models	Bonaire (convention center)

Bernie Jackson - IPS (Interplanetary Scintillation)
Burcu Kosar - Aurorasaurus (presented by Yongliang Zhang)
James Weygand - Magnetometers
Stan Sazykin - Rice Convection Model (presented by TBD)
Discussion

3:00pm – 4:15pm	D Ground Magnetic Perturbations: dBdt, delta-B, GICs, FACs Revising and Improving the SWPC-CCMC dB/dt validation challenge	Montego (main building)
3:00pm – 4:15pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Introduction on SPASE, IMPEX, and CCMC (chairs: Chiu, Justin) Archive 101 and the SPASE effort - Todd King IMPEX effort and IMPEX NG- Tarek Al-Ubaidi CCMC Metadata effort - Chiu Wiegand CCMC Metrics & Validation Framework - Justin Boblitt CDPP VO activities including SPASE - Mikel Indurain	Antigua (main building)
3:00pm – 4:15pm	H Global & Regional TEC Team goals: Ludger Scherliess Overview of CCMC validation studies for TEC prediction: Ja Soon Shim Overview of Space Weather Forecast Testbed: Tony Mannucci General Discussion	Bermuda (main building)
3:00pm – 4:15pm	O OPEN room available to everyone (informal meetings/other)	Bahamas (convention center)
3:00pm – 4:15pm	O OPEN room available to everyone (informal meetings/other)	Aruba (convention center)
3:00pm – 4:15pm	R Joint session: All Radiation & Plasma Effects Teams SEEs; Radiation Effects for Aviation; Surface Charging; Internal Charging; Total dose Each radiation team: 10 min overview + 5 min discussion	Trinidad (convention center)
3:00pm – 4:15pm	1 Coronal & Solar Wind Structure <ul style="list-style-type: none">• Discuss any practical operational metrics for the 4 sub-topics (Coronal Hole Boundaries, Coronal Structure, Ambient Solar Wind, Solar Wind Structure).• Start this discussion with some slides/input from forecasting agencies about their wish list.• Discussion on these specific metrics from the modelers and data providers perspective.• Brief intro on the IT framework we already have in hand from the SHINE Validation effort from a few years ago as a possible foundation for assessment.	Jamaica (main building)
3:00pm – 4:15pm	T Assessment of Understanding and Quantifying Progress Discussion for Measurements of Success for societal benefit	Martinique (main building)
4:15pm – 4:45pm	B Coffee Break	Convention Center & Hotel Main Building
4:45pm – 6:00pm	A Auroral precipitation and high latitude ionosphere electrodynamics <i>continue items from previous session</i>	Bonaire (convention center)
4:45pm – 6:00pm	G Geomagnetic Indices	Montego (main building)
4:45pm – 6:00pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Introduction on SPASE, IMPEX, and CCMC (chairs: Chiu, Justin) Topic: continue from the previous session	Antigua (main building)
4:45pm – 6:00pm	Z Joint session: IMF Bz; CME Arrival Time & Impact; and 3D CME kinematics and topology <ul style="list-style-type: none">• Discussion of event selection and training/initial, validation, and test sets of events.• CME scoreboard discussion• Discussion about observational data used to validate models• Discussion about models inputs	Salons II & III (convention center)
4:45pm – 6:00pm	H Ionosphere Plasma Density: NmF2/foF2, hmF2, TEC	Bermuda (main building)

Team goals & Overview of previous studies for foF2 prediction: Ioanna Tsagouri

General Discussion on model validation:

- Models and data to be used
- Data file format and registration of data and metadata for development of on-line tools at CCMC
- Metrics (initial consideration)

4:45pm – 6:00pm	O OPEN room available to everyone (informal meetings/other)	Bahamas (convention center)
4:45pm – 6:00pm	O OPEN room available to everyone (informal meetings/other)	Aruba (convention center)
4:45pm – 6:00pm	R Surface Charging (Joint session: Surface Charging; Internal Charging; Total dose)	Trinidad (convention center)
4:45pm – 6:00pm	1 Coronal & Solar Wind Structure <ul style="list-style-type: none">• Start Science Progress debate for the 4 topics• beginning with the CH and coronal structure topics ?• presentation of talking points received in advance of the meeting. Those in attendance can present their contributions.	Jamaica (main building)
4:45pm – 6:00pm	T Assessment of Understanding and Quantifying Progress Discussion of potential programmatic which could encourage a focus of research benefits to society	Martinique (main building)
6:15pm – 7:45pm	B Icebreaker Join your colleagues in Flamingo's Lounge Bar (no host bar) in the main hotel building for "speed collaborating".	Flamingo's Lounge Bar (hotel main building)

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APRIL 4 • TUESDAY

8:00am – 9:00am	B Breakfast	Hotel Main Building
9:00am – 10:15am	A Joint session: Ground Magnetic Perturbations: dBdt, delta-B, GICs, FACs Team & Aurora Team Revising and Improving the SWPC-CCMC dB/dt validation challenge	Montego (main building)
9:00am – 10:15am	C CME Arrival Time & Impact <i>Metrics</i> <ul style="list-style-type: none">• Metrics discussion and examples• Metrics addressing user needs vs. scientific research• Discussion questions• 1st set of events for validation• Preliminary model validation/results• Alex Wold: Real-time ENLIL run validation & discussion• Marilena Mierla (not attending): comparisons of ENLIL and EUHFORIA• More 2-3 slide contributions from participants• CME scoreboard discussion• Suzy Bingham: Initial CME scoreboard verification from the UK Met Office	Jamaica (main building)
9:00am – 10:15am	I Information Architecture for Interactive Archives (IAIA) IAIA: Connecting different VXO and data center across the globe (chairs: Chiu, Justin) Heliophysics Application Programmer's Interface (HAPI) - Jon Vandegriff	Antigua (main building)
9:00am – 10:15am	H Neutral Density and Orbit Determination at LEO Thermosphere Neutral Density Modeling and Observations (chair: Stan Solomon) <i>Speakers:</i> <ul style="list-style-type: none">LWS Institute: Yongliang ZhangMURI project: Yue DengADAM/Dragster project: Geoff Crowley or substituteNOAA/CIRES activities: Mariangel FedrizziHAO/NCAR activities: Stan Solomon Discussion	Bermuda (main building)
9:00am – 10:15am	T Assessment of Understanding and Quantifying Progress Discussion of Application of ARL to the LWS SSA's and other end goals	Martinique (main building)
10:15am – 10:45am	B Coffee Break	Hotel Main Building
10:45am – 12:00pm	F Solar Flares <i>Topic: Flare prediction methods & User Needs</i> <ul style="list-style-type: none">• Scene setting presentation (Sophie/Manolis)• Rob Steenburgh: Flare forecasts at SWPC and end-users.• Participants can give a 2-3 slide description of their method• Who uses flare forecasts? What do they care about? Large flares vs smaller flares? False positives? All-clear forecasts?	Jamaica (main building)
10:45am – 12:00pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Connecting different VXO and data center across the globe (chair: chiu, justin) Getting IMPEx simulation data into VESPA - Tarek Al-Ubaidi IMPEx achievements : CDPP in-situ plasma data comparison to simulation - Mikel Indurain	Antigua (main building)
10:45am – 12:00pm	H Neutral Density and Orbit Determination at LEO “continue items from previous session”	Bermuda (main building)

10:45am – 12:00pm	H Joint session: Ionosphere Plasma Density; Scintillation; TEC Chair: Ludger Scherliess Speakers: Ioanna Tsagouri - quiet-time variation Endawoke Yizengaw - Title TBD Jonathan Krall - plasmaspheric contribution to TEC	Montego (main building)
10:45am – 12:00pm	T Assessment of Understanding and Quantifying Progress Discuss potential ways to track how quickly advancements are applied	Martinique (main building)
12:00pm – 3:00pm	B Lunch (on own)	.
1:30pm – 2:45pm	A Auroral precipitation and high latitude ionosphere electrodynamics	Montego (main building)
1:30pm – 2:45pm	R SEEs (Joint session: SEEs; Radiation Effects for Aviation; Total Dose)	Jamaica (main building)
1:30pm – 2:45pm	T Assessment of Understanding and Quantifying Progress Discussion about Tracking Users of Space physics research	Martinique (main building)
1:30pm – 3:00pm	Optional informal meetings	Hotel Main Building
3:00pm – 4:15pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Tools Demo&Discussion (chair: Asher, Chiu) Automated SPASE Metadata Generation for DSCOVER - William Rowland/Anna Milan Kameleon metadata application - Asher Pembroke TAP-Sheet - Tarek Al-Ubaidi A prototype to describe (with IMPEX DM) a CCMC simulation and how to access it via CDPP tools - Mikel Indurain The Transplanet RoR interface, its serialized/automatic IMPEX descriptions and how runs are accessed in tools (AMDA, 3DView, Topcat, Autoplot) - Mikel Indurain SPASE Metadata generator - Todd King CCMC Metadata Registry - Chiu Wiegand	Antigua (main building)
3:00pm – 4:15pm	H Ionosphere Scintillation Discussion on how to find the good way of estimating the day-to-day variability of: Electric Field, Neutral Wind, Gravity Wave, and other drivers.	Montego (main building)
3:00pm – 4:15pm	H Neutral Density and Orbit Determination at LEO Satellite Drag and Orbital Dynamics (chair: Sean Bruinsma) <i>Speakers</i> Semi-empirical models and their evaluation: Sean Bruinsma HASDM: Kent Tobiska Tutorial on Orbit Determination: Sean Bruinsma John Emmert Amanda Shelton Discussion	Bermuda (main building)
3:00pm – 4:15pm	R SEPs <i>Introduction and general discussion</i> <ul style="list-style-type: none"> • Introduction: 2-3 slide contributions from participants introducing yourself, your interest in the SEP team, or slides related to any of the discussion items below. • User needs discussion • SEP scoreboard introduction • Validation for science vs. user needs • How to define: event, event duration, event start onset time • Which observations and derived quantities to compare against? • Event selection discussion 	Jamaica (main building)
3:00pm – 4:15pm	T Assessment of Understanding and Quantifying Progress Discussion of framework for communication between researchers and users	Martinique (main building)

4:15pm – 4:45pm	B Coffee Break	Hotel Main Building
4:45pm – 6:00pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Tools Demo&Discussion (chairs: Asher, Chiu) Topic: continue from the previous session	Antigua (main building)
4:45pm – 6:00pm	H Global & Regional TEC General Discussion and several short presentations (~5minutes) on <ul style="list-style-type: none"> • How can we improve the validation efforts for TEC specification and prediction? • How do we quantify progress? • Next generation validation efforts • Future directions 	Montego (main building)
4:45pm – 6:00pm	H Neutral Density and Orbit Determination at LEO <i>continue items from previous session</i>	Bermuda (main building)
4:45pm – 6:00pm	R SEPs <i>Metrics Discussion (2-3 slide contributions from participants on any of the discussion items)</i> <ul style="list-style-type: none"> • What quantities to validate? <ul style="list-style-type: none"> • Onset time or threshold crossing time • Duration • Profile shape/rate of increase • Capturing SEP vs No SEP (all clear) • Which energy ranges, which thresholds? • How to compare models/methods <ul style="list-style-type: none"> • Model settings: Do some models need to be tuned for each event? Can they run for a long event period without parameter changes? • Reducing false alarms and misses • Which reference model or climatology to use? • Comparing models with different forecast types (deterministic vs probabilistic) • Collecting relevant models outputs for systematic comparisons (example: SEP scoreboard XML schema) • Observations <ul style="list-style-type: none"> • What observations are needed as SEP model inputs? • Models running on retrospective vs. real-time inputs • Incorporating radio observations 	Jamaica (main building)
4:45pm – 6:00pm	T Assessment of Understanding and Quantifying Progress Continue discussion of how to measure and track successes	Martinique (main building)
6:15pm – 7:45pm	B Confab/Palaver/Argy-Bargy/Townhall: A Lively Discussion to Bridge the Scientist/User Gap All are invited to an informal discussion to address the challenges in turning “pure” scientific results into societal and operational utility. Scientists: How to identify societal benefit of your research? Users: How to determine what science will most effectively help you? Both: How do we determine and quantify what effort and resources are needed to bridge the gap? <i>Appetizers served.</i>	Jamaica (main building)

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APRIL 5 • WEDNESDAY

8:00am – 9:00am	B Breakfast	Salons II & III (convention center)
9:00am – 9:10am	P How This Workshop Fits Into the NRC/NAS Decadal Survey of Solar and Space Physics (and thus the future of Heliophysics) <i>Speaker: Aaron Roberts</i>	Salons II & III (convention center)
9:10am – 9:30am	P Information Architecture for Model Assessment <i>Speaker: Justin Boblitt, Chiu Wiegand</i>	Salons II & III (convention center)
9:30am – 10:15am	P Working Team Updates 5 min status update reports from working team leads: <ul style="list-style-type: none"> ◦ Assessment of Understanding and Quantifying Progress - <i>Alexa Halford</i> ◦ Coronal & Solar Wind Structure - <i>Peter MacNeice</i> ◦ CME Arrival Time - <i>Christine Verbeke</i> ◦ SEPs - <i>Ian Richardson</i> ◦ Ground Magnetic Perturbations: dBdt, delta-B, GICs, FACs - <i>Dan Welling</i> ◦ Neutral Density and Orbit Determination at LEO - <i>Stan Solomon</i> 	Salons II & III (convention center)
10:15am – 10:45am	B Coffee Break	Convention Center
10:45am – 12:00pm	3 3D CME kinematics and topology	Jamaica (main building)
10:45am – 12:00pm	C CME Arrival Time & Impact <i>Metrics & Impact of background solar wind</i> <ul style="list-style-type: none"> • Continue items remaining from Metrics session • Scene setting presentation on quantifying the effects of background solar wind • Discussion on impact of background solar wind, 2-3 slide contributions from participants • Continue other discussion items from previous sessions 	Salons II & III (convention center)
10:45am – 12:00pm	G Geomagnetic Indices	Bermuda (main building)
10:45am – 12:00pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Post-Processing Tools/Discussion (chair: Asher) Interpolation of simulation data - Asher Pembroke	Antigua (main building)
10:45am – 12:00pm	H Joint session: All Ionosphere Teams & Solar Indices Team Chair: Karin Muglach <i>Speakers:</i> Kent Tobiska (Space Environment Technologies, 30 min): "Solar proxies and indices for use in operations and modeling" Frank Eparvier (LASP, 10 min): "GOES-16 and Beyond: Measurements and Data Products from the new EUV and X-Ray Irradiance Sensors (EXIS)" Martin Snow (LASP, 10 min): "The MgII Index - the future begins now" Ed Thiemann (LASP, 10 min): "Irradiance Index Insights from the MAVEN and GOES-R Spectral Irradiance Models"	Martinique (main building)
10:45am – 12:00pm	O OPEN room available to everyone (informal meetings/other)	Montego (main building)
10:45am – 12:00pm	O OPEN room available to everyone (informal meetings/other)	Bahamas (convention center)
10:45am – 12:00pm	O OPEN room available to everyone (informal meetings/other)	Bonaire (convention center)
10:45am – 12:00pm	R Internal Charging (Joint session: Internal Charging; Surface Charging; Total dose)	Trinidad (convention center)
10:45am – 12:00pm	T Assessment of Understanding and Quantifying Progress	Aruba (convention center)

What do we mean by a metric and what types of metrics are there

12:00pm – 1:30pm	B Team Leads Lunch Meeting <i>All team leads are invited to a working lunch (provided) in the general session room to interface with the Tracking Progress team leads.</i>	Salons II & III (convention center)
12:00pm – 3:00pm	B Lunch (on own)	.
1:30pm – 2:45pm	T Assessment of Understanding and Quantifying Progress How to find an appropriate metric	Aruba (convention center)
1:30pm – 3:00pm	Optional informal meetings	Convention Center & Hotel Main Building
2:00pm – 3:00pm	P Open house/Q&A <i>This time has nearly no overlap with workshop sessions and provides participants an opportunity to ask questions/discuss with team leads.</i>	Salons II & III (convention center)
3:00pm – 4:15pm	F Solar Flares <i>Topic: Validation metrics for flare prediction</i> <ul style="list-style-type: none">• Discussion of different skills scores and categorical vs. probabilistic forecasts.• Discussion of how different metrics might be useful for different end-users or scientific use.• Jordan Guerra (not attending): ensemble prediction and discussion on what metrics should be optimized• Contributions from participants on metrics	Jamaica (main building)
3:00pm – 4:15pm	N Joint session: All Ionosphere Teams & Geomagnetic Indices Team Chair: Mike Liemohn <i>Speakers:</i> Stan Solomon, Sean Bruinsma	Martinique (main building)
3:00pm – 4:15pm	G Magnetopause location and geosynchronous orbit crossing <ul style="list-style-type: none">• Nowcasting and forecasting of the magnetopause and bow shock—A status update (Steven Petrinec, Lockheed Martin)• GEM Model Challenges; Metrics and Skill Scores already done (Lutz Rastaetter, NASA GSFC)• Events description:<ul style="list-style-type: none">• Magnetospheric balance of solar wind dynamic pressure [Jan 13, 2013 and Jun 23, 2015 events] (Ramon Lopez, UTA).• Comparison of MHD models and Geosync. Orbits Crossings (Yari Collado-Vega, NASA GSFC)• OTHER EVENTS - list of good magnetopause crossings observations. It will be good to have conjunctions of different missions, if possible (MMS, THEMIS, Cluster, Geotail).	Montego (main building)
3:00pm – 4:15pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Coding/Hacking Session (chair: Asher/Rick)	Antigua (main building)
3:00pm – 4:15pm	Z IMF Bz <ol style="list-style-type: none">1. Background Solar Wind Conditions2. Core event selection3. Magnetic What? (Rob Steenburgh: User Needs)----- BREAK ----- (~3.40-3.50pm)4. B Magnitude threshold5. Time resolution6. Validation Metrics	Salons II & III (convention center)
3:00pm – 4:15pm	O OPEN room available to everyone (informal meetings/other)	Bahamas (convention center)
3:00pm – 4:15pm	O OPEN room available to everyone (informal meetings/other)	Bonaire (convention center)
3:00pm – 4:15pm	O OPEN room available to everyone (informal meetings/other)	Bermuda (main building)
3:00pm – 4:15pm	R Total dose (Joint session: Total dose; Surface Charging; Internal Charging)	Trinidad (convention center)
3:00pm – 4:15pm	T Assessment of Understanding and Quantifying Progress Writing time	Aruba (convention center)

4:15pm – 4:45pm	B Coffee Break	Convention Center & Hotel Main Building
4:45pm – 6:00pm	A Joint session: All Ionosphere Teams & Aurora Team Chair: Robert Robinson <i>Speakers:</i> Stan Solomon, Tim Fuller-Rowell (Mariangel Fedrizzi), Yongliang Zhang	Martinique (main building)
4:45pm – 6:00pm	F Solar Flares <i>Topic: Fusion of flare prediction and validation methods toward the next generation of flare prediction capabilities.</i> • Action items for the future relation to the Flare Scoreboard (validation; XML file; metadata) • Event selection, choosing active and quiet time periods (make sure there is HMI / other data availability for modelers). • Future: collect model outputs for these periods - jointly validate.	Jamaica (main building)
4:45pm – 6:00pm	G Magnetopause location and geosynchronous orbit crossing • The last-closed drift shell (LCDS) computations (Adam Kellerman, UCLA) • Scientific "end-user" requirements in regards to our VERB code simulations and real-time forecasting (Adam Kellerman, UCLA) • User Needs identified by SWPC (Howard Singer, NOAA SWPC) • User needs identified by NASA (Antti Pulkkinen, NASA GSFC) • New developments and why validation is important for Science: Soft X-ray Imaging of the Magnetosphere (Kip Kuntz, JHU) • Discussion of the 5 min team update on Thursday	Montego (main building)
4:45pm – 6:00pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Open Discussion with Other Teams/Lesson learned on using and implementing the data model (chairs: Chiu, Daniel, Darren, Todd) Lesson learned from CDP: SPASE-IMPEX DM needed/envisioned evolutions - Mikel Indurain	Antigua (main building)
4:45pm – 6:00pm	O OPEN room available to everyone (informal meetings/other)	Bahamas (convention center)
4:45pm – 6:00pm	O OPEN room available to everyone (informal meetings/other)	Bermuda (main building)
4:45pm – 6:00pm	O OPEN room available to everyone (informal meetings/other)	Bonaire (convention center)
4:45pm – 6:00pm	R Radiation at Aviation Altitudes (Joint Session: Radiation Effects for Aviation; SEEs; Total Dose)	Trinidad (convention center)
4:45pm – 6:00pm	1 Coronal & Solar Wind Structure • Discuss science progress for the ambient solar wind and solar wind structure topics	Salons II & III (convention center)
4:45pm – 6:00pm	T Assessment of Understanding and Quantifying Progress Writing time	Aruba (convention center)

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APRIL 6 • THURSDAY

8:00am – 9:00am	B Breakfast	Salons II & III (convention center)
9:00am – 10:15am	P Working Team Updates 5 min status update reports from working team leads: <ul style="list-style-type: none"> ◦ Solar Flare Prediction - <i>Sophie Murray</i> ◦ 3D CME kinematics and topology - <i>Barbara Thompson</i> ◦ IMF Bz at L1 - <i>Neel Savani</i> ◦ Radiation (all teams) - <i>Yihua Zheng</i> ◦ Geomagnetic Indices - <i>Mike Liemohn</i> ◦ Magnetopause location and geosync. orbit crossing - <i>Yari Collado-Vega</i> ◦ Auroral precipitation and high latitude ionosphere electrodynamics - <i>Bob Robinson</i> ◦ Solar Indices and Irradiance - <i>Frank Eparvier</i> ◦ Ionosphere (TEC, Scintillation, Eden) - <i>Ioanna Tsagouri</i> 	Salons II & III (convention center)
10:15am – 10:45am	B Coffee Break	Convention Center
10:45am – 12:00pm	3 3D CME kinematics and topology	Salons II & III (convention center)
10:45am – 12:00pm	N Geomagnetic Indices	Bonaire (convention center)
10:45am – 12:00pm	G Magnetopause location and geosynchronous orbit crossing <i>Overall Discussion and preparation for domain presentation on Friday</i>	Montego (main building)
10:45am – 12:00pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Visualization Demo/Discussion (chairs: Darren, Lutz) Visualization with IDL Visualization with Plotly: Implementation of Interactive Visualization for DSCOVER - William Rowland/Lutz Rastaetter Kameleon Visualization - Asher Pembroke CCMC VR effort - Asher Pembroke ViSBARD visualization tool - Aaron Roberts	Antigua (main building)
10:45am – 12:00pm	H Joint session: All Ionosphere Teams Uncertainty Assessment; Biases in Observations and Models; Selection of time intervals Ioanna Tsagouri: "Uncertainty in ionosphere background and event selection" Chunming Wang: Space Weather Forecast Testbed	Martinique (main building)
10:45am – 12:00pm	O OPEN room available to everyone (informal meetings/other)	Bahamas (convention center)
10:45am – 12:00pm	O OPEN room available to everyone (informal meetings/other)	Bermuda (main building)
10:45am – 12:00pm	R Joint session: Surface Charging; Internal Charging	Trinidad (convention center)
10:45am – 12:00pm	R Joint Session: SEPs; SEEs; Radiation Effects for Aviation; Total Dose <ul style="list-style-type: none"> • Discussion of user needs for each team's topic area • Event selection, finding a common event period for initial study 	Jamaica (main building)
10:45am – 12:00pm	T Assessment of Understanding and Quantifying Progress Developing a framework for a library of ARLs, Metrics, and Validation techniques	Aruba (convention center)
12:00pm – 3:00pm	B Lunch (on own)	.
1:30pm – 2:45pm	H Global & Regional TEC <i>Continuation of Tuesday's presentations and discussions</i>	Martinique (main building)

1:30pm – 2:45pm	1 Solar Indices and Irradiance	Bermuda (main building)
1:30pm – 2:45pm	T Assessment of Understanding and Quantifying Progress Recap of measuring success	Aruba (convention center)
1:30pm – 3:00pm	Optional informal meetings	Convention Center & Hotel Main Building
2:00pm – 3:00pm	F Open house/Q&A <i>This time has nearly no overlap with workshop sessions and provides participants an opportunity to ask questions/discuss with team leads.</i> Teams leads at open house: Solar Flares, IMF Bz.	Salons II & III (convention center)
3:00pm – 4:15pm	A Auroral precipitation and high latitude ionosphere electrodynamics	Bonaire (convention center)
3:00pm – 4:15pm	D Ground Magnetic Perturbations: dBdt, delta-B, GICs, FACs	Montego (main building)
3:00pm – 4:15pm	G Geomagnetic Indices	Bahamas (convention center)
3:00pm – 4:15pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Team Planning Session. chairs: Chiu, Daniel, Darren, Todd	Antigua (main building)
3:00pm – 4:15pm	Z IMF Bz 1. Summary of Previous session. 2. Complete actions items from previous session 3. THE FUTURE: ARL positioning for Bz actions ----- BREAK ----- (~3.40-3.50pm) 4. THE FUTURE: CCMC Bz Scoreboard? 5. THE FUTURE: Improve interfacing between R2O with O2R? 6. THE FUTURE: Open-Mic Action items (+Congratulate ourselves for a job well done)	Salons II & III (convention center)
3:00pm – 4:15pm	H Ionosphere Plasma Density: NmF2/foF2, hmF2, TEC Selection of Metrics Summary, Conclusion and Action Plans	Bermuda (main building)
3:00pm – 4:15pm	H Neutral Density and Orbit Determination at LEO Scenarios for Uncertainty Assessment Exercises for ND and OD	Martinique (main building)
3:00pm – 4:15pm	R Joint session: SEEs; Radiation Effects for Aviation; Total Dose	Trinidad (convention center)
3:00pm – 4:15pm	1 Coronal & Solar Wind Structure Pulling it all together, and developing a plan of action for the next 6-12 months.	Jamaica (main building)
3:00pm – 4:15pm	T Assessment of Understanding and Quantifying Progress Recap of our findings for the ARLs	Aruba (convention center)
4:15pm – 4:45pm	B Coffee Break	Convention Center & Hotel Main Building
4:45pm – 6:00pm	A Auroral precipitation and high latitude ionosphere electrodynamics	Bonaire (convention center)
4:45pm – 6:00pm	C CME Arrival Time & Impact <i>Summary and future plans</i> • Remaining discussion questions • Quantifying progress in the field of CME arrival & impact • Summary of team progress • Future plans, meetings, remote collaboration	Salons II & III (convention center)
4:45pm – 6:00pm	D Ground Magnetic Perturbations: dBdt, delta-B, GICs, FACs	Montego (main building)
4:45pm – 6:00pm	I Information Architecture for Interactive Archives (IAIA) IAIA: Open Discussion with Other Teams/Understanding the needs of other working teams (chairs: Todd, Chiu, Darren, Daniel)	Antigua (main building)

- Can the current metadata model support other working teams on their validation effort?
- How to describe event base outputs (ex: flare, SEP, CME arrival predictions)?

4:45pm – 6:00pm	Z IMF Bz	Jamaica (main building)
4:45pm – 6:00pm	H Ionosphere Scintillation <ul style="list-style-type: none"> • Discussion on validating the models with respect to the metrics • Wrap-up discussion on how to find the good way of estimating the day-to-day variability of the drivers 	Bermuda (main building)
4:45pm – 6:00pm	H Neutral Density and Orbit Determination at LEO Outstanding Topics, Summary and Action Plans	Martinique (main building)
4:45pm – 6:00pm	O OPEN room available to everyone (informal meetings/other)	Bahamas (convention center)
4:45pm – 6:00pm	R Joint session: All Radiation and Plasma Effects Teams SEEs; Radiation Effects for Aviation; Surface Charging; Internal Charging; Total dose Each radiation team: 10 min overview + 5 min discussion	Trinidad (convention center)
4:45pm – 6:00pm	T Assessment of Understanding and Quantifying Progress Recap of developing a framework for a library of metrics and validation techniques	Aruba (convention center)

APRIL 7 • FRIDAY

8:00am – 9:00am	B Breakfast	Salons II & III (convention center)
9:00am – 10:20am	P Working Team Progress Reports by Domain 20 minutes each (12 min + 8 min discussion) <ul style="list-style-type: none"> ◦ Solar Domain Progress Report - <i>Peter MacNeice</i> ◦ Heliosphere Domain Progress Report - <i>Neel Savani & Ian Richardson</i> ◦ Radiation & Plasma Effects Domain Progress Report - <i>Yihua Zheng</i> ◦ Information Architecture for Interactive Archives Progress Report - <i>Darren De Zeeuw</i> 	Salons II & III (convention center)
10:20am – 10:40am	B Coffee Break	Convention Center
10:40am – 12:00pm	P Working Team Progress Reports by Domain 20 minutes each (12 min + 8 min discussion) <ul style="list-style-type: none"> ◦ Geomagnetic Environment Progress Report - <i>Lutz Rastaetter</i> ◦ Auroral Region Progress Report - <i>Bob Robinson</i> ◦ Ionosphere Progress Report - <i>Ludger Scherliess</i> ◦ Quantifying Scientific Progress Progress Report - <i>Alexa Halford</i> 	Salons II & III (convention center)
12:00pm – 12:30pm	B Coffee break including sandwiches	Convention Center
12:30pm – 2:00pm	P Discussion & Wrap-up <ul style="list-style-type: none"> • Future Forum plans: <ul style="list-style-type: none"> - How working teams will proceed? How CCMC can better facilitate progress? - Opportunities for collecting community feedback and engaging more active participants at upcoming workshops (e.g., GEM, CEDAR, SHINE, ASEC 17, ESWW14) - Opportunity for an event at COSPAR 2018 • Feedback from participants about the meeting. Plans for future focused working meetings of this kind. • Open discussion 	Salons II & III (convention center)
3:00pm – 6:00pm	Optional informal meetings	Convention Center