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PREFACE

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Special issue "The 12th International Conference on Substorms"

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The 12th International Conference on Substorms (ICS-12) was held at the Ise-Shima Royal Hotel in Shima, Japan, on November 10–14, 2014. There were 125 attendees including 68 from foreign countries. The ICS has been held every 2 years since 1992 to discuss substorms, which are fundamental global-scale disturbances in the Earth's magnetosphere. The year 2014 marked the 50th anniversary of the first publication about substorms (Akasofu 1964). The conference included three tutorial lecturers (Profs. S.-I. Akasofu, V. Angelopoulous, and D. Baker), as well as many international scientists, to discuss substorm processes in the tail, their interactions with the inner magnetosphere and the ionosphere, substorm currents and their dynamics and energetics, the role of MagnetoHydroDynamics (MHD) and kinetic instabilities, storm–substorm relationships, ULF/ELF/VLF waves, and non-Earth substorm-like features. Prof. Akasofu also gave an evening talk about the history of auroral research since the nineteenth century with photographs that inspired and intrigued the young scientists and students in attendance.

This special issue presents 16 papers from the ICS-12 presentations. The topics and related papers are: control of magnetospheric conditions by solar wind parameters (Kubyshkina et al. 2015; Sergeev et al. 2015; Troshichev and Sormakov 2015), modeling of reconnection and instabilities in the tail (Birn et al. 2015; Pritchett 2015; Uchino and Machida 2015), relationships between relativistic electrons and pulsations in the inner magnetosphere (Antonova and Stepanova 2015; Hajra et al. 2015; Teramoto et al. 2016), the effects of substorms on ionospheric irregularities and currents (Berngardt et al. 2015; Cherniak and Zakharenkova 2015; Connors and Rostoker 2015), auroral disturbances during substorms (Antonova et al. 2015; Connors et al. 2015; Tanaka et al. 2015), and ground magnetometer chains (Connors et al. 2016). In addition, a review paper by Akasofu (2015) based on his presentation at ICS-12 was published in *Progress in Earth and Planetary Science*. These papers provide a comprehensive overview of recent progress in research related to substorms from solar wind to the ionosphere. We hope that these publications provide resources for the understanding of the various physical processes that occur in the magnetosphere and ionosphere during substorms.

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Authors' contributions
All authors of this article served as the guest editors for this special issue. KS prepared this preface with the agreement of the other authors. All authors read and approved the final manuscript.

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Competing interests
The authors declare that they have no competing interests.

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