Over the last decade we have witnessed a convergence of various technological forces that have produced a wide-range of location-tracking technologies. Examples of such technologies include the use of Global Positioning System (GPS) devices and Radio Frequency Identification (RFID) technology to tag and track physical objects as they move around in physical space. Rapid advances in semiconductor technologies and efficiencies achieved from producing these location-tracking devices in large volumes have made it possible to manufacture these devices for a small cost, making mass deployments of such devices possible. These location-tracking technologies are enabling a new class of location-based applications that require managing traditional databases and dynamically changing location information. Examples of such location-based application include using location information in vehicle navigation and emergency response, the use of RFID tags for tracking objects in retail supply-chain systems, and the use of location-based information in mobile e-commerce. Managing such location-information poses a number of new challenges for database management systems. The focus of this issue is on the database methods and applications related to location data management.

The first article by Mokbel and Aref presents the PLACE database server which treats the sequence of continually changing location information from a moving object as a spatio-temporal data stream. The PLACE system combines data stream management methods and spatio-temporal query processing methods to produce an efficient database server for handling location-based queries and triggers.

The second article by Cao, Wolfson, Xu, and Yin, presents the MOBI-DIC platform which combines peer-to-peer methods and spatio-temporal data management. Mobile object in their system collaborate to allow searching for local information from mobile devices and also enables the discovery of spatio-temporal resources (such as the currently available free parking slots).

Sending location information from a mobile device to a backend server can consume valuable (and limited) power resources on the mobile device. The third article by Hu and Lee presents a power efficient scheme for updating the location of moving objects.

Recognizing the commercial importance of supporting location-based query processing in the DBMS, Oracle already provides various spatial expressions and rules for supporting location-based services. The next article by Yalamanchi, Kothuri, and Ravada, presents these features which are available in Oracle 10g.

The final article by Krumm and Shafer lays out various practical issues with representing, generating, and efficiently querying location information. This article presents the data management issue for supporting location-based services based on a number of actual examples of such applications.

Location-based applications and notification services are likely to revolutionize the way in which we track physical objects and use dynamic location-based information as we move around in physical space. The five articles presented in this issue provide an overview of some of the challenges and the opportunities in expanding the scope of database management systems to include management of location information. Location-based technologies are predicted to continue it tremendous growth for the next decade and are likely to become even more pervasive in the future. In other words, this area presents significant research and commercial opportunities for the database community. Hopefully, this issue will continue to feed existing interest, and perhaps stimulate new interest, in the database community for this emerging class of application.