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Nota di contenuto	Past, present and future electron microscopy of liquid specimens / Niels de Jonge and Frances M. Ross -- Encapsulated liquid cells for transmission electron microscopy / Eric Jensen and Kristian Mølhave -- Imaging liquid processes using open cells in the tem, sem, and beyond / Chongmin Wang -- Membrane based environmental cells for sem in liquids / Andrei Kolmakov -- Observations in liquids using an inverted SEM / Chikara Sato and Mitsuo Suga -- Temperature control in liquid cells for TEM / Shen J. Dillon and Xin Chen -- Electron beam effects in liquid cell TEM and STEM / Nicholas M. Schneider -- Resolution in liquid cell experiments / Niels de Jonge, Nigel Browning, James E. Evans, See Wee Chee and Frances M. Ross -- Nanostructure growth, interactions and assembly in the liquid phase / Hong-Gang Liao, Kai-Yang Niu and Haimei Zheng -- Quantifying electrochemical processes using liquid cell TEM / Frances M. Ross -- Application of

electrochemical liquid cells for electrical energy storage and conversion studies / Raymond R. Unocic and Karren L. More -- Applications of liquid cell TEM in corrosion science / See Wee Chee and M. Grace Burke -- Nanoscale water imaged by liquid cell TEM / Utkur Mirsaidov and Paul Matsudaira -- Nanoscale deposition and etching of materials using focused electron beams and liquid reactants / Eugenii U. Donev, Matthew Bresin and J. Todd Hastings -- Liquid cell TEM for studying environmental and biological mineral systems / Michael H. Nielsen and James J. De Yoreo -- Liquid STEM for studying biological function in whole cells / Diana B. Peckys and Niels de Jonge -- Visualizing macromolecules in liquid at the nanoscale / Andrew C. Demmert, Madeline J. Dukes, Elliot Pohlmann, Kaya Patel, A. Cameron Varano, Zhi Sheng, Sarah M. McDonald, Michael Spillman, Utkur Mirsaidov, Paul Matsudaira, and Deborah F. Kelly -- Application of liquid cell microscopy to study function of muscle proteins / Haruo Sugi, Shigeru Chaen, Tsuyoshi Akimoto, Masaru Tanokura, Takuya Miyakawa and Hiroki Minoda -- High resolution imaging in the graphene liquid cell / Jungwon Park, Vivekananda P. Adiga, Alex Zettl, and A. Paul Alivisatos -- Analytical electron microscopy during in situ liquid cell studies / Megan E. Holtz, David A. Muller, and Nestor J. Zaluzec -- Spherical and chromatic aberration correction for atomic-resolution liquid cell electron microscopy / Rafal E. Dunin-Borkowski and Lothar Houben -- The potential for imaging dynamic processes in liquids with high temporal resolution / Nigel D. Browning and James E. Evans -- Future prospects for biomolecular, biomimetic and biomaterials research enabled by new liquid cell electron microscopy techniques / Taylor Woehl and Tanya Prozorov.

Sommario/riassunto

The first book on the topic, with each chapter written by pioneers in the field, this essential resource details the fundamental theory, applications, and future developments of liquid cell electron microscopy. This book describes the techniques that have been developed to image liquids in both transmission and scanning electron microscopes, including general strategies for examining liquids, closed and open cell electron microscopy, experimental design, resolution, and electron beam effects. A wealth of practical guidance is provided, and applications are described in areas such as electrochemistry, corrosion and batteries, nanocrystal growth, biomineralization, biomaterials and biological processes, beam-induced processing, and fluid physics. The book also looks ahead to the future development of the technique, discussing technical advances that will enable higher resolution, analytical microscopy, and even holography of liquid samples. This is essential reading for researchers and practitioners alike.