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978-1-108-73353-3 — Modularity and Dynamics on Complex Networks  
Renaud Lambiotte, Michael T. Schaub  
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# Cambridge Elements

Elements in the Structure and Dynamics of Complex Networks

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## MODULARITY AND DYNAMICS ON COMPLEX NETWORKS

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University Printing House, Cambridge CB2 8BS, United Kingdom  
One Liberty Plaza, 20th Floor, New York, NY 10006, USA  
477 Williamstown Road, Port Melbourne, VIC 3207, Australia  
314–321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre,  
New Delhi – 110025, India  
103 Penang Road, #05–06/07, Visioncrest Commercial, Singapore 238467

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[www.cambridge.org](http://www.cambridge.org)  
Information on this title: [www.cambridge.org/9781108733533](http://www.cambridge.org/9781108733533)  
DOI: 10.1017/9781108774116

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First published 2021

*A catalogue record for this publication is available from the British Library.*

ISBN 978-1-108-73353-3 Paperback  
ISSN 2516-5763 (online)  
ISSN 2516-5755 (print)

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## Modularity and Dynamics on Complex Networks

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DOI: 10.1017/9781108774116  
First published online: December 2021

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**Abstract:** Complex networks are typically not homogeneous, as they tend to display an array of structures at different scales. A feature that has attracted a lot of research is their modular organisation (i.e., networks may often be considered as being composed of certain building blocks, or modules). In this Element, the authors discuss a number of ways in which this idea of modularity can be conceptualised, focusing specifically on the interplay between modular network structure and dynamics taking place on a network. They discuss, in particular, how modular structure and symmetries may impact on network dynamics and, vice versa, how observations of such dynamics may be used to infer the modular structure. They also revisit several other notions of modularity that have been proposed for complex networks and show how these can be related to and interpreted from the point of view of dynamical processes on networks.

**Keywords:** modularity, networks, time scale, dynamics, block models

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ISBNs: 9781108733533 (PB), 9781108774116 (OC)  
ISSNs: 2516-5763 (online), 2516-5755 (print)

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