

TWELFTH SUMMER SYMPOSIUM IN REAL ANALYSIS

AUGUST 9 - 12, 1988

UNIVERSITY OF ULSTER, COLERAINE, NORTHERN IRELAND

IN HONOR OF PROFESSOR RALPH HENSTOCK

The twelfth summer symposium in real analysis was held August 9-12, 1988 at the University of Ulster, Coleraine, Northern Ireland, as a tribute to Professor Ralph Henstock and his many significant contributions to the theory of nonabsolutely continuous integrals. The organizing committee was chaired by Professor P. Muldowney of the University of Ulster, Magee College, Londonderry. The staff of the Real Analysis Exchange wishes to express its appreciation to Professor Muldowney for his untiring efforts in putting together this excellent conference. Also to be thanked for their support are the following: The Royal Society, London Mathematical Society, Royal Irish Academy, Institute of Mathematics and its Applications, Department of Education (UK), Northern Ireland Tourist Board, Ulster Bank, Bushmill's Distillery, The University of Ulster, and Mr. Fred Quigg, fisherman and gardener of Magilligan near Limavady.

Ralph Henstock was born June 2, 1923. He joined St. John's College, Cambridge, in 1941. In 1943 he was classified Wrangler in Part 2 of the Mathematical Tripos, becoming a Scholar of St. John's. (Due to war-time conditions, Part 1 was omitted from the course.) In November 1943 he was sent to London on war service to do statistical work for the Ministry of Supply. In 1944 he was awarded the Cambridge B. A. and began research in integration theory at Birkbeck College, London. His subsequent academic career has included the following appointments:

Assistant Lecturer, Birkbeck, 1948-51

Lecturer, Queen's University, Belfast, 1951-56

Lecturer, Bristol University, 1956-60

Senior Lecturer and Reader, Queen's, 1960-64

Reader, Lancaster University, 1964-70

Chair, New University of Ulster, University of Ulster, 1970-88.

Recently, he was awarded an Emeritus Fellowship by the Leverhulme Trust. In addition to over thirty research papers, his publications include Theory of Integration (1963), Linear Analysis (1968), and Lectures on the Theory of Integration (1988). Currently, he is writing General Theory of Integration for the Oxford University Press.

The symposium featured hour addresses by Professor Henstock and

P. S. Bullen, University of British Columbia
G. Cross, University of Waterloo
J. Kurzweil, Czechoslovakian Academy of Science
P.-Y. Lee, National University of Singapore
J. L. Mawhin, University of Louvain
W. F. Pfeffer, University of California, Davis
C. A. Rogers, University College London
Y. Kubota, Ibaraki University
V. Skvortsov, Moscow State University

Other participants included T.S. Chew (U. Singapore), S. Foglio (U. Sao Carlos), C. Gorez (U. Louvain), R. Kernohan (North Down College), S. Leader (Rutgers U.), P. Maritz (U. Stellenbosch), A. Marquetty (U. Metz), R. McCartney (Open U.), M. Morayne (U. Wrocław), P. Muldowney (U. Ulster), D. Nonnenmacher (U. Ulm), K. Ostaszewski (U. Louisville), N. Parkes (North Down College), G. Shannon (U. Ulster), J. Stegeman (U. Utrecht), S.J. Taylor (U. Virginia), and W. Yang (U. California - Davis).

The 1988 ANDY was awarded to T.S. Chew of Singapore.

The complete program appears on the following pages. This is followed by summaries of the talks. The staff of the Exchange wishes to thank the speakers for preparing these summaries! As the expository presentation of Professor George Cross was based on material which appears elsewhere, he has elected to not include a write-up here. At the time of this printing summaries were regrettably not available for the talks of Professors Marquetty and Skvortsov.

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TUESDAY AUGUST 9 chair Lee P.Y.

- 9.00 - 9.55 P.Bullen (U. British Columbia) Applications of a theorem of Marcinkiewicz
10.05 - 10.30 P.Muldowney (U.Ulster) Infinite-dimensional generalised Riemann integrals
10.30 - 11.00 Coffee break
11.00 - 11.55 G.Cross (U. Waterloo) Generalised integrals
12.05 - 12.30 M.Morayne (U. Wroclaw) Decomposing Baire functions
12.30 - 2.00 Lunch break
2.00 - 2.55 R.Henstock (U.Ulster) Integration over function spaces
2.55 - 3.30 Coffee break
3.30 - 3.55 K.Ostaszewski (U. Louisville) Embedding Henstock integrable functions in the space of Schwarz distributions
4.05 - 4.30 J.D.Stegeman (U.Utrecht) On Malliavin's proof of non-spectral synthesis

WEDNESDAY AUGUST 10 chair G.Cross

- 9.00 - 9.55 J.Kurzweil (Czechosl. Acad. Sc.) A non-absolutely convergent integral which admits transformation
10.05 - 10.30 C.Pierson-Gorez (U.C.Louvain) Integrals on unbounded intervals and convergence of double series
10.30 - 11.00 Coffee break
11.00 - 11.55 Lee P.Y. (U.Singapore) Generalised convergence theorems for Denjoy-Perron integrals
12.05 - 12.30 Wei-Chi Yang (U.California Davis) The multi-dimensional variational integral and its extensions
12.30 - 2.00 Lunch break
2.00 - 2.55 J.L.Mawhin (U.C.Louvain) Applications of multiple generalised Riemann integrals
2.55 - 3.30 Coffee break
3.30 - 3.55 P.Maritz (U.Stellenbosch) Open and image-open multifunctions
4.05 - 4.30 W.F.Pfeffer (U.California Davis) Some remarks on Stokes' theorem

THURSDAY AUGUST 11 chair J.Mawhin

- 9.00 - 9.55 W.F.Pfeffer (U.California Davis) Small subspaces of the reals
- 10.05 - 10.30 Chew T.S. (U. Singapore) The superposition operator in the space of Henstock-Kurzweil integrals
- 10.30 - 11.00 Coffee break
- 11.00 - 11.55 C.A.Rogers (U.C.London) Dimension prints for sets in Euclidean space
- 12.05 - 12.30 S.Foglio (U.Sao Carlos) New and old results connected with Henstock's integrals
- 12.30 - 2.00 Lunch break

FRIDAY AUGUST 12 chair W.Pfeffer

- 9.00 - 9.55 Y.Kubota (Ibaraki U.) Extension of the Denjoy integral
- 10.05 - 10.30 S.Leader (Rutgers U.) More on differentials defined by generalised Riemann integration on 1-cells
- 10.30 - 11.00 Coffee break
- 11.00 - 11.55 V.Skvortsov (Moscow State U.) A dyadic Henstock integral
- 12.05 - 12.30 A.Marquetty (U.Metz) Non-standard analysis and the Henstock integral
- 12.30 - 2.00 Lunch break
- 2.00 - 2.30 G.Goodman (U.Florence) A generalised Weierstrass curvilinear integral
- 2.30- Concluding session
- 3.00 Coffee break