Cinquant' anni di relatività, 1905–1955. Ed. by M. Pantaleo. Firenze, Editrice Universitaria, 1955. 50+634 pp.

This volume contains, besides a preface by Einstein and a general introduction by the editor, articles by A. Aliotta, G. Armellini, P. Caldirola, B. Finzi, G. Polvani, F. Severi, and P. Straneo, and translations into Italian of seven of Einstein's papers.

RESEARCH PROBLEMS

1. John Nash: *Generalized Brouwer Theorem.*

Define a "connectivity map" from a space A into a space B as one such that the induced map $A \to A \times B$ preserves the connectedness of any connected set in A. Must every connectivity map of a cell into itself have a fixed point? (Received August 24, 1955.)

2. C. S. Herz: *The Bohr spectrum of bounded functions.*

Let ϕ be a bounded, uniformly continuous function on the real line. Is it true that for almost all t, $\lim_{N\to\infty} (2N)^{-1}\int_{-N}^{N} \exp(-itx)\phi(x)dx = 0$? (Received October 10, 1955.)

3. J. L. Brenner: *Group Theory.*

Find the (algebraic) real values of m (between 0 and 2) for which the matrices $\binom{1,0}{m,1}$, $\binom{1,m}{0,1}$ do not generate a free group. 1. When m is transcendental the group is known to be a free group. 2. When m is real and greater than or equal to 2 the group can be shown to be a free group.) (Received October 20, 1955.)

4. H. L. Alder: *Number theory.*

Let $q_d(n)$ = the number of partitions of n into parts differing by at least d; let $Q_d(n)$ = the number of partitions of n into parts congruent to 1 or $d+2$ (mod $d+3$); let $\Delta_d(n) = q_d(n) - Q_d(n)$. It is known that $\Delta_1(n) = 0$ for all positive n (Euler's identity), $\Delta_2(n) = 0$ for all positive n (one of the Rogers-Ramanujan identities), $\Delta_3(n) \geqq 0$ for all positive n (from Schur's theorem which states $\Delta_3(n)$ = the number of those partitions of n into parts differing by at least 3 which contain at least one pair of consecutive multiples of 3). a. Is $\Delta_d(n) \geqq 0$ for all positive d and n? b. If (a) is true, can $\Delta_d(n)$ be characterized as the number of a certain type of restricted partitions of n as is the case for $d=3$?

References

1. D. H. Lehmer, *Two nonexistence theorems on partitions*, Bull. Amer. Math. Soc. vol. 52 (1946) pp. 538–544.

2. H. L. Alder, *The nonexistence of certain identities in the theory of partitions and compositions*, Bull. Amer. Math. Soc. vol. 54 (1948) pp. 712–722.

(Received October 24, 1955.)

5. V. L. Klee: *Topology.*

A topological space S is called *homogeneous* provided for each two points x and y of S there is a homeomorphism h of S onto S such that $hx = y$. Clearly each product of homogeneous spaces is homogeneous. O. H. Keller [Math. Ann. vol. 105 (1931) pp. 748–758] has proved that the Hilbert parallelotope $[0, 1]^{\aleph_0}$ is homogeneous. Thus $[0, 1]^{\aleph_0}$ and $[0, 1]$ are spaces whose product is homogeneous, even though $[0, 1]$ is not homogeneous. Questions: Is there a manifold M (with or without boundary) such that $M^{\aleph_0}$ is non-homogeneous? Are there compact metric spaces A and B such that $A \times B$ is homogeneous even though *neither* A nor B is homogeneous? (Received November 9, 1955.)

6. V. L. Klee: *Topology.*

It is known [Trans. Amer. Math. Soc. vol. 74 (1953) p. 36] that Hilbert space H has the following property: If Y is a metric space and f and g are homeomorphisms of Y into H, then f and g are isotopic in H. Is this property possessed by any nondegenerate finite-dimensional metric space? (Received November 9, 1955.)