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CIS-491925

[Bauer, Mark](#); [Bennett, Michael A.](#) Ramanujan-Nagell cubics. [Rocky Mountain Journal of Mathematics](#) 48 (2018), no. 2, 385—412.

[Article](#)

A well-known result of Beukers on the generalized Ramanujan-Nagell equation has, at its heart, a lower bound on the quantity  $|x^2 - 2^n|$ . In this paper, we derive an inequality of the shape  $|x^3 - 2^n| \geq x^{4/3}$ , valid provided  $x^3 \neq 2^n$  and  $(x, n) \neq (5, 7)$ , and then discuss its implications for a variety of Diophantine problems.

CIS-295576

[Guillera, Jesús](#) Mosaic Supercongruences of Ramanujan Type. [Experimental Mathematics](#) 2012 (2012).

[Article](#)

In this article, we present analogues of supercongruences of Ramanujan type observed by L. Van Hamme and W. Zudilin. Our congruences are inspired by Ramanujan-type series that involve quadratic algebraic numbers.

CIS-336174

[Pizer, Arnold K.](#) Ramanujan graphs and Hecke operators. [Bulletin of the American Mathematical Society](#) 23 (1990), no. 1, 127—137.

[Article](#)

CIS-344984

[Lehmer, D. H.](#) Ramanujan's function  $\tau(n)$ . [Duke Mathematical Journal](#) 10 (1943), no. 3, 483—492.

[Article](#)

CIS-400288

[Ewell, J. A.](#) On Ramanujan's Tau Function. [Rocky Mountain Journal of Mathematics](#) 28 (1998), no. 2, 453—461.

[Article](#)

CIS-477353

[Grytczuk, Aleksander](#) On Ramanujan sums on arithmetical semigroups. [Tsukuba Journal of Mathematics](#) 16 (1992), no. 2, 315—319.

[Article](#)

CIS-307136

[Alder, Henry L.](#) Generalizations of the Rogers-Ramanujan identities.. [Pacific Journal of Mathematics](#) 4 (1954), no. 2, 161—168.

[Article](#)

CIS-322684

[Lyons, Russell](#); [Peres, Yuval](#) Cycle density in infinite Ramanujan graphs. [The Annals of Probability](#) 43 (2015), no. 6, 3337—3358.

[Article](#)

We introduce a technique using nonbacktracking random walk for estimating the spectral radius of simple random walk. This technique relates the density of nontrivial cycles in simple random walk to that in nonbacktracking random walk. We apply this to infinite Ramanujan graphs, which are regular graphs whose spectral radius equals that of the tree of the same degree. Kesten showed that the only infinite Ramanujan graphs that are Cayley graphs are trees. This result was extended to unimodular random rooted regular graphs by Abért, Glasner and Virág. We show that an analogous result holds for all regular graphs: the frequency of times spent by simple random walk in a nontrivial cycle is a.s. 0 on every infinite Ramanujan graph. We also give quantitative versions of that result, which we apply to answer another question of Abért, Glasner and Virág, showing that on an infinite Ramanujan graph, the probability that simple random walk encounters a short cycle tends to 0 a.s. as the time tends to infinity.

CIS-345385

[Cohen, Eckford](#) An extension of Ramanujan's sum. [Duke Mathematical Journal](#) 16 (1949), no. 1, 85—90.

[Article](#)

CIS-346453

[Horadam, E. M.](#) Ramanujan's sum for generalised integers. [Duke Mathematical Journal](#) 31 (1964), no. 4, 697—702.

[Article](#)

CIS-347195

[Hirschhorn, M. D.](#) Partitions and Ramanujan's continued fraction. [Duke Mathematical Journal](#) 39 (1972), no. 4, 789—791.

[Article](#)

CIS-360349

[KATAYAMA, Koji](#) Ramanujan's formulas for  $L$ -functions. [Journal of the Mathematical Society of Japan](#) 26 (1974), no. 2, 234—240.

[Article](#)

CIS-374479

[Shahidi, Freydoon](#) Arthur packets and the Ramanujan conjecture. [Kyoto Journal of Mathematics](#) 51 (2011), no. 1, 1—23.

[Article](#)

The purpose of this article is to show that under a part of the generalized Arthur's  $A$ -packet conjecture, locally generic cuspidal automorphic representations of a quasi-split group over a number field are of Ramanujan type, that is, are tempered at almost all places. The  $A$ -packet conjecture allows one to reduce the problem to a special case of a general local question about the components of the corresponding Langlands  $L$ -packet which is then answered here in its generality.

CIS-393798

[Apostol, Tom M.](#) Arithmetical properties of generalized Ramanujan sums.. [Pacific Journal of Mathematics](#) 41 (1972), no. 2, 281 — 293 .

[Article](#)

CIS-396618

[Johnson, Kenneth R.](#) A reciprocity law for Ramanujan sums.. [Pacific Journal of Mathematics](#) 98 (1982), no. 1, 99 — 105 .

[Article](#)

CIS-396810

[Johnson, Kenneth R.](#) Unitary analogs of generalized Ramanujan sums.. [Pacific Journal of Mathematics](#) 103 (1982), no. 2, 429 — 432 .

[Article](#)

CIS-397160

[Andrews, George E.](#) Multiple series Rogers-Ramanujan type identities.. [Pacific Journal of Mathematics](#) 114 (1984), no. 2, 267 — 283 .

[Article](#)

CIS-397365

[Subbarao, M. V.](#) Some Rogers-Ramanujan type partition theorems.. [Pacific Journal of Mathematics](#) 120 (1985), no. 2, 431 — 435 .

[Article](#)

CIS-420576

[Manzoli, Donald J.](#) Ramanujan: A tale of two evaluations. [Rocky Mountain Journal of Mathematics](#) 46 (2016), no. 3, 925 — 938 .

[Article](#)

In 1887, beneath a canopy of stars, Srinivasa Ramanujan commenced his brief existence on this planet. In a universe at the mercy of its entropy, against all odds, a genius was born. His destiny was mathematics, a subject born thousands of years earlier. The power of this discipline is not to be denied. After all, with our minds in the stars, we have placed footprints on the moon. The conquest of the moon was a triumph of applied mathematics; however, it was the landscape of pure mathematics that awaited Ramanujan. In time, he would explore it with passion, leaving footprints lasting for eternity.

Professor Bruce C. Berndt has done a remarkable job of editing the notebooks Ramanujan left behind. In particular, Berndt's Chapter 9 of `\textit{Ramanujan's notebooks Part I}` provides a magnificent in-depth look at raw mathematical talent in action. The primary purpose of this article is to present three Chapter-9 related results, a series evaluation and two new functional equations, that Ramanujan either missed or his work on them was lost. The secondary purpose is to present what Berndt calls a "corrected version" `\cite [page 233]{Berndt}` of an incorrect Chapter-9 formula of Ramanujan. This series evaluation represents one of the few serious mistakes to be found in Ramanujan's work.

CIS-462537

[Gelman, Andrew](#) Tables as graphs: the Ramanujan principle. [Significance](#) 8 (2011), no. 4 .

[Article](#)

Andrew Gelman says that there is more visual information in a table than you might realise, so it is worth presenting them well.

CIS-484618

[Hermon, Jonathan](#) Cutoff for Ramanujan graphs via degree inflation. [Electronic Communications in Probability](#) 2017 (2017), no. 72 .

[Article](#)

Recently Lubetzky and Peres showed that simple random walks on a sequence of  $d$ -regular Ramanujan graphs  $G_n = (V_n, E_n)$  of increasing sizes exhibit cutoff in total variation around the diameter lower bound  $\frac{d}{d-2} \log_{d-1} |V_n|$ . We provide a different argument under the assumption that for some  $r(n) \gg 1$  the maximal number of simple cycles in a ball of radius  $r(n)$  in  $G_n$  is uniformly bounded in  $n$ .

CIS-288902

[Shahidi, Freydoon](#) On the Ramanujan Conjecture for Quasisplit Groups. [Asian Journal of Mathematics](#) 8 (2004), no. 4, 813 — 836 .

[Article](#)

Early experiences with classical (holomorphic) cusp forms, which initially started with the Ramanujan  $t$ -function, and later extended to even Maass cusp forms (cf. [70]; [78], last paragraph) on the upper half plane, suggested that their Fourier coefficients  $a_p$  at a prime  $p$  must be bounded by  $2p^{(k-1)/2}$ , where  $k$  is the weight (cf. [25, 96]). This is what is classically called the Ramanujan-Petersson conjecture. Its archimedean counterpart, the Selberg conjecture [79], states that the positive eigenvalues of the hyperbolic Laplacian on the space of cuspidal functions (functions vanishing at all the cusps) on a hyperbolic Riemann surface parametrized by a congruence subgroup must all be at least  $1/4$  (cf. [76, 79, 94]). While for the holomorphic modular cusp forms, this is a theorem ([25], also see [8, 12]), the case of Maass forms is far from resolved and both conjectures are yet unsettled and out of reach. Satake [78] was the first to observe that both conjectures can be uniformly formulated. More precisely, if one considers the global cuspidal representation attached to a given cuspidal eigenfunction, then all its local components must be tempered. This means that their matrix coefficients must all belong to  $L^2 + (PGL_2(Q_p))$  for all  $e > 0$  and every prime  $p$  of  $Q$ . We note that here we are allowing  $p = 8$  and letting  $Q_{inf} = R$ . It is now generally believed that the conjecture in its general form should be valid for  $GL_n$  over number fields to the effect that all the local components of an irreducible (unitary) cuspidal representation of  $GL_n(AF)$  must be tempered (modulo center).

CIS-295409

[Ritter, Gordon](#) A Hardy-Ramanujan Formula for Lie Algebras. [Experimental Mathematics](#) 2007 (2007) .

[Article](#)

We study certain combinatoric aspects of the set of all unitary representations of a finite-dimensional semisimple Lie algebra  $\mathfrak{g}$ . We interpret the Hardy-Ramanujan-Rademacher formula for the integer partition function as a statement about  $\mathfrak{su}_2$ , and explore in some detail the generalization to other Lie algebras. We conjecture that the number  $\mathfrak{Mod} \mathfrak{g} d$  of  $\mathfrak{g}$ -modules in dimension  $d$  is given by  $(\alpha/d) \exp(\beta d^\gamma)$  for  $d \gg 1$ , which (if true) has profound consequences for other combinatorial invariants of  $\mathfrak{g}$ -modules. In particular, the fraction  $\mathfrak{FracMod} \mathfrak{g} d$  of  $d$ -dimensional  $\mathfrak{g}$ -modules that have a one-dimensional submodule is determined by the generating function for  $\mathfrak{Mod} \mathfrak{g} d$ . The dependence of  $\mathfrak{FracMod} \mathfrak{g} d$  on  $d$  is

complicated and beautiful, depending on the congruence class of  $d \pmod n$  and on generating curves that resemble a double helix within a given congruence class. We also summands in the direct sum decomposition as a function on the space of all  $g$ -modules in a fixed dimension, and plot its histogram. This is related to the concept (used in quantum information theory) of noiseless subsystem. We identify a simple function that is conjectured to be the asymptotic form of the aforementioned histogram, and verify numerically that this is correct for  $su_n$ .

CIS-343827

[Jordan, Bruce W.;](#) [Livné, Ron](#). The Ramanujan property for regular cubical complexes. [Duke Mathematical Journal](#) 105 (2000), no. 1, 85 —103 .

[Article](#)

CIS-344038

[Friedman, Joel](#) Relative expanders or weakly relatively Ramanujan graphs. [Duke Mathematical Journal](#) 118 (2003), no. 1, 19 —35 .

[Article](#)

Let  $G$  be a fixed graph with largest (adjacency matrix) eigenvalue  $\lambda \geq 0$  and with its universal cover having spectral radius  $\rho$ . We show that a random cover of large degree over  $G$  has its "new" eigenvalues bounded in absolute value by roughly  $\sqrt{\lambda \rho}$ .

This gives a positive result about finite quotients of certain trees having "small" eigenvalues, provided we ignore the "old" eigenvalues. This positive result contrasts with the negative result of A. Lubotzky and T. Nagnibeda which showed that there is a tree all of whose finite quotients are not "Ramanujan" in the sense of Lubotzky, R. Phillips, and P. Sarnak and of Y. Greenberg.

Our main result is a "relative version" of the Broder-Shamir bound on eigenvalues of random regular graphs. Some of their combinatorial techniques are replaced by spectral techniques on the universal cover of  $G$ . For the choice of  $G$  that specializes our main theorem to the Broder-Shamir setting, our result slightly improves theirs.

CIS-346625

[Horadam, E. M.](#) Addendum to: "Ramanujan' sum for generalised integers". [Duke Mathematical Journal](#) 33 (1966), no. 4, 705 —707 .

[Article](#)

CIS-346813

[Carlitz, L.](#) A note on the Rogers-Ramanujan identities. [Duke Mathematical Journal](#) 35 (1968), no. 4, 839 —842 .

[Article](#)

CIS-352927

[Niebur, Douglas](#) A formula for Ramanujan's  $\tau$ -function. [Illinois Journal of Mathematics](#) 1975 (1975) .

[Article](#)

CIS-376305

[Chu, Wenchang;](#) [Zhang, Wenlong](#) Iteration method for multiple Rogers-Ramanujan identities. [Kodai Mathematical Journal](#) 32 (2009), no. 3, 471 —500 .

[Article](#)

Inspired by the recursive lemma due to Bressoud (1983), we present an iteration process for constructing transformations from unilateral multiple basic hypergeometric series to bilateral univariate one. Applications are illustrated to multiple series transformation formulae and multiple Rogers-Ramanujan identities.

CIS-398634

[Ding, Hongming;](#) [Gross, Kenneth L.;](#) [Richards, Donald St. P.](#) Ramanujan's master theorem for symmetric cones.. [Pacific Journal of Mathematics](#) 175 (1996), no. 2, 447 —490 .

[Article](#)

CIS-412681

[Chen, Shi-Chao](#) Ramanujan-type congruences for certain generating functions. [Lithuanian Mathematical Journal](#) 53 (2013), no. 4, 381 —390 .

[Article](#)

For nonnegative integers  $a, b$ , the function  $d_{a,b}(n)$  is defined in terms of the  $q$ -series

$$\sum_{n=0}^{\infty} d_{a,b}(n)q^n = \prod_{n=1}^{\infty} (1 - q^{an})^b / (1 - q^n).$$
 We establish some Ramanujan-type congruences for  $d_{a,b}(n)$  by the theory of modular forms with complex multiplication. As consequences, we generalize the famous Ramanujan congruences for the partition function  $p(n)$  modulo 5, 7, and 11.

CIS-171096

[Fulman, Jason](#) A probabilistic proof of the Rogers-Ramanujan identities. [The Bulletin of the London Mathematical Society](#) 33 (2001), no. 163, 397 —407 .

**Keywords:** [Markov chains](#)

CIS-290985

[Musitelli, Antoine;](#) [de la Harpe, Pierre](#) Expanding graphs, Ramanujan graphs, and 1-factor perturbations. [Bulletin of the Belgian Mathematical Society-Simon Stevin](#) 13 (2006), no. 4, 673 —680 .

[Article](#)

We construct  $(k \pm 1)$ -regular graphs which provide sequences of expanders by adding or subtracting appropriate 1-factors from given sequences of  $k$ -regular graphs. We compute numerical examples in a few cases for which the given sequences are from the work of Lubotzky, Phillips, and Sarnak (with  $k - 1$  the order of a finite field). If  $k + 1 = 7$ , our construction results in a sequence of 7-regular expanders with all spectral gaps at least  $6 - 2\sqrt{5} \approx 1.52$ ; the corresponding minoration for a sequence of Ramanujan 7-regular graphs (which is not known to exist) would be  $7 - 2\sqrt{6} \approx 2.10$ .

CIS-295251

[Guillera, Jesús](#) About a New Kind of Ramanujan-Type Series. [Experimental Mathematics](#) 12 (2003), no. 4, 507 —510 .

[Article](#)

We propose a new kind of Ramanujan-type formula for  $\{1/\pi^2\}$  and conjecture that it is related to the theory of modular functions.

CIS-295875

[Bairy, K. Sushan ; Chandankumar, S. ; Naika, M.S. Mahadeva](#) New identities for Ramanujan's cubic continued fraction. [Functiones et Approximatio Commentarii Mathematici](#) 46 (2012), no. 1, 29 —44 .

[Article](#)

In this paper, we present some new identities providing relations between Ramanujan's cubic continued fraction  $V(q)$  and the other three continued fractions  $V(q^9)$ ,  $V(q^{17})$  and  $V(q^{19})$ . In the process, we establish some new modular equations for the ratios of Ramanujan's theta functions. We also establish some general formulas for the explicit evaluations of ratios of Ramanujan's theta functions.

CIS-345233

[Lehmer, D. H.](#) The vanishing of Ramanujan's function  $\tau(n)$ . [Duke Mathematical Journal](#) 14 (1947), no. 2, 429 —433 .

[Article](#)

CIS-345660

[Anderson, Douglas R. ; Apostol, T. M.](#) The evaluation of Ramanujan's sum and generalizations. [Duke Mathematical Journal](#) 20 (1953), no. 2, 211 —216 .

[Article](#)

CIS-345833

[Cohen, Eckford](#) An extension of Ramanujan's m. II. Additive properties. [Duke Mathematical Journal](#) 22 (1955), no. 4, 543 —550 .

[Article](#)

CIS-346537

[Gordon, Basil](#) Some continued fractions of the Rogers-Ramanujan type. [Duke Mathematical Journal](#) 32 (1965), no. 4, 741 —748 .

[Article](#)

CIS-353741

[Codecà, Paolo](#) A note on Ramanujan coefficients of arithmetical functions. [Illinois Journal of Mathematics](#) 1991 (1991) .

[Article](#)

CIS-399404

[Borwein, J.M. ; Borwein, P.B.](#) Approximating  $\pi$  with Ramanujan's solvable modular equations. [Rocky Mountain Journal of Mathematics](#) 19 (1989), no. 1, 93 —102 .

[Article](#)

CIS-399659

[Masson, David R.](#) Wilson polynomials and some continued fractions of Ramanujan. [Rocky Mountain Journal of Mathematics](#) 21 (1991), no. 1, 489 —499 .

[Article](#)

CIS-401183

[Son, Seung H.](#) Basic Functional Equations of the Rogers-Ramanujan Functions. [Rocky Mountain Journal of Mathematics](#) 37 (2007), no. 2, 653 —662 .

[Article](#)

CIS-458110

[Backhausz, Ágnes ; Szegedy, Balázs ; Virág, Bálint](#) Ramanujan graphings and correlation decay in local algorithmst. [Random Structures & Algorithms](#) 46 (2015), no. 3, 424 —435 .

[Article](#)

Let  $G$  be a  $d$ -regular graph of sufficiently large-girth (depending on parameters  $k$  and  $r$ ) and  $\mu$  be a random process on the vertices of  $G$  produced by a randomized local algorithm of radius  $r$ . We prove the upper bound  $(k+1-2k/d)(1d-1)k$  for the (absolute value of the) correlation of values on pairs of vertices of distance  $k$  and show that this bound is optimal. The same results hold automatically for factor of i.i.d processes on the  $d$ -regular tree. In that case we give an explicit description for the (closure) of all possible correlation sequences. Our proof is based on the fact that the Bernoulli graphing of the infinite  $d$ -regular tree has spectral radius  $2d-1$ . Graphings with this spectral gap are infinite analogues of finite Ramanujan graphs and they are interesting on their own right. © 2014 Wiley Periodicals, Inc. *Random Struct. Alg.*, 47, 424–435, 2015

CIS-458545

[Haxell, P. E. ; Kohayakawa, Y.](#) On an anti-Ramsey property of Ramanujan graphs. [Random Structures & Algorithms](#) 6 (1995), no. 4, 417 —431 .

[Article](#)

If  $G$  and  $H$  are graphs, we write  $G \rightarrow H$  (respectively,  $G \rightarrow TH$ ) if for any proper edge-coloring  $\gamma$  of  $G$  there is a subgraph  $H' \subset G$  of  $G$  isomorphic to  $H$  (respectively, isomorphic to a subdivision of  $H$ ) such that  $\gamma$  is injective on  $E(H')$ . Let us write  $Cl$  for the cycle of length  $l$ . Spencer (cf. Erdős 10)) asked whether for any  $g \geq 3$  there is a graph  $G = Gg$  such that (i)  $G$  has girth  $g(G)$  at least  $g$  and (ii)  $G \rightarrow TC3$ . Recently, Rödl and Tuza [22] answered this question in the affirmative by proving, using nonconstructive methods, a result that implies that, for any  $t \geq 1$ , there is a graph  $G = Gt$  of girth  $t + 2$  such that  $G \rightarrow C2t+2$ . In particular, condition (ii) may be strengthened to (iii)  $G \rightarrow C$  for some  $l = l(G)$ . For  $G = Gt$  above  $l(G) = 2t + 2 = 2g(G) - 2$ . Here, we show that suitable Ramanujan graphs constructed by Lubotzky, Phillips, and Sarnak [18] are explicit examples of graphs  $G = Gg$  satisfying (i) and (iii) above. For such graphs,  $l(G)$  in (iii) may be taken to be roughly equal to  $(3/2)g(G)$ , thus considerably improving the value  $2g(G) - 2$  given in the result of Rödl and Tuza. It is not known whether there are graphs  $G$  of arbitrarily large girth for which (iii) holds with  $l(G) = g(G)$ .

CIS-484609

[KIUCHI, Isao](#) On Sums of Averages of Generalized Ramanujan Sums. [Tokyo Journal of Mathematics](#) 40 (2017), no. 1, 255 —275 .

[Article](#)

We shall consider some formulas for weighted averages of the generalized Ramanujan sum  $\sum_{d|gcd(k,n)} f(d)g(k/d)h(n/d)$  for any arithmetical functions  $f$ ,  $g$  and  $h$ , with the weights concerning completely multiplicative functions, completely additive functions and others.

CIS-483484

[Srivastava, Bhaskar](#) SOME IDENTITIES CONNECTED WITH A CONTINUED FRACTION OF RAMANUJAN. [Taiwanese Journal of Mathematics](#) 16 (2012), no. 3, 829 —838 .

[Article](#)

We first prove two identities which are analogous to Entry 3.3.4 in Ramanujan's lost notebook. The identities in Entry 3.3.4 come out equal to a cubic theta function of Borwein and Borwein [5]. In our case they come out equal to  $\frac{(q^4; q^4)_\infty^2}{(q^2; q^2)_\infty^2} C^2(q)$ . We also express



$C(q)$  in terms of theta functions  $\phi(q)$  and  $\psi(q)$ . A series expansion of  $\log C(q)$  is also given. One of the identities (9) is equivalent to a Theorem in partitions.

CIS-527163

[Schinzel, A.](#) On an analytic problem considered by Sierpiński and Ramanujan. (1992), 165 —171 .

CIS-307340

[Singh, V. N.](#) Certain generalized hypergeometric identities of the Rogers-Ramanujan type.. [Pacific Journal of Mathematics](#) 7 (1957), no. 1, 1011 —1014 .

[Article](#)

CIS-309037

[Berndt, Bruce C.](#); [Lamphere, Robert L.](#); [Wilson, B.M.](#) Chapter 12 of Ramanujan's second notebook: Continued fractions. [Rocky Mountain Journal of Mathematics](#) 15 (1985), no. 2, 235 —310 .

[Article](#)

CIS-345456

[Bellman, Richard](#) Ramanujan sums and the average value of arithmetic functions. [Duke Mathematical Journal](#) 17 (1950), no. 2, 159 —168 .

[Article](#)

CIS-351460

[Chu, Wenchang.](#); [Zhang, Wenlong.](#) Four classes of Rogers–Ramanujan identities with quintuple products. [Hiroshima Mathematical Journal](#) 41 (2011), no. 1, 27 —40 .

[Article](#)

Combining the finite form of Jacobi's triple product identity with the  $q$ -Gauss summation theorem, we present a new and unified proof for the two transformation lemmas due to Andrews (1981). The same approach is then utilized to establish two further transformations from unilateral to bilateral series. They are employed to review forty identities of Rogers–Ramanujan type with quintuple products.

CIS-384843

[Duverney, Daniel.](#); [Shiokawa, Iekata.](#) On some arithmetical properties of Rogers-Ramanujan continued fraction. [Osaka Journal of Mathematics](#) 37 (2000), no. 3, 759 —771 .

[Article](#)

CIS-396507

[Andrews, George E.](#) The Rogers-Ramanujan reciprocal and Minc's partition function.. [Pacific Journal of Mathematics](#) 95 (1981), no. 2, 251 —256 .

[Article](#)

CIS-396846

[Al-Salam, Waleed A.](#); [Ismail, Mourad E. H.](#) Orthogonal polynomials associated with the Rogers-Ramanujan continued fraction.. [Pacific Journal of Mathematics](#) 104 (1983), no. 2, 269 —283 .

[Article](#)

CIS-399323

[Andrews, George E.](#) The Rogers-Ramanujan identities without Jacobi's Triple Product. [Rocky Mountain Journal of Mathematics](#) 17 (1987), no. 4, 659 —672 .

[Article](#)

CIS-402038

[Chen, Xiaoqing.](#); [Chu, Wenchang.](#) Carlitz inversions and identities of the Rogers-Ramanujan type. [Rocky Mountain Journal of Mathematics](#) 44 (2014), no. 4, 1125 —1142 .

[Article](#)

By means of the inverse series relations due to Carlitz  $\{cite\{carlitz\}$ , we establish several transformation formulae for nonterminating  $q$ -series, which will systematically be employed to review identities of the Rogers-Ramanujan type moduli 5, 7, 8, 10, 14 and 27.

CIS-402319

[Berndt, Bruce C.](#) Modular transformations and generalizations of several formulae of Ramanujan. [Rocky Mountain Journal of Mathematics](#) 7 (1977), no. 1, 147 —190 .

[Article](#)

CIS-491573

[Gun, Sanoli.](#); [Saha, Biswajyoti.](#) Multiple Lerch Zeta Functions and an Idea of Ramanujan. [The Michigan Mathematical Journal](#) 2018 (2018), no. 1516330974 .

[Article](#)

In this article, we derive meromorphic continuation of multiple Lerch zeta functions by generalizing an elegant identity of Ramanujan. Further, we describe the set of all possible singularities of these functions. Finally, for the multiple Hurwitz zeta functions, we list the exact set of singularities.

CIS-295279

[Borwein, J.](#); [Crandall, R.](#); [Fee, G.](#) On the Ramanujan AGM Fraction, I: The Real-Parameter Case. [Experimental Mathematics](#) 2004 (2004) .

[Article](#)

The Ramanujan AGM continued fraction is a construct  $\{small$

$$\mathcal{R}_\eta(a, b) = \frac{a}{\eta + \frac{b^2}{\eta + \frac{4a^2}{\eta + \frac{9b^2}{\eta + \dots}}}}$$

$\}$

enjoying attractive algebraic properties, such as a striking arithmetic-geometric mean (AGM) relation and elegant connections with elliptic-function theory. But the fraction also presents an intriguing computational challenge. Herein we show how to rapidly evaluate  $\mathcal{R}$  for any triple of positive reals  $a, b, \eta$ . Even in the problematic scenario when  $a \approx b$  certain transformations allow rapid evaluation. In this process we find, for example, that when  $a\eta = b\eta = a$  a rational number,  $\mathcal{R}_\eta$  is essentially an  $L$ -series that can be cast as a finite sum of fundamental numbers. We ultimately exhibit an algorithm that yields  $D$  good digits of  $\mathcal{R}$  in  $O(D)$  iterations where the implied big- $O$  constant is independent of the positive-real triple  $a, b, \eta$ . Finally, we address the evidently profound theoretical and computational dilemmas attendant on complex parameters, indicating how one might extend the AGM relation for complex parameter domains.

CIS-295280

[Borwein, J.](#); [Crandall, R.](#) On the Ramanujan AGM Fraction, II: The Complex-Parameter Case. [Experimental Mathematics](#) 2004 (2004).

[Article](#)

The Ramanujan continued fraction {small

$$\mathcal{R}_\eta(a, b) = \frac{a}{\eta + \frac{b^2}{\eta + \frac{4a^2}{\eta + \frac{9b^2}{\eta + \dots}}}}$$

}

is interesting in many ways; e.g., for certain complex parameters  $(\eta, a, b)$  one has an attractive AGM relation

$\mathcal{R}_\eta(a, b) + \mathcal{R}_\eta(b, a) = 2\mathcal{R}_\eta\left(\frac{a+b}{2}, \sqrt{ab}\right)$ . Alas, for some parameters the continued fraction  $\mathcal{R}_\eta$  does not converge;

moreover, there are converging instances where the AGM relation itself does not hold. To unravel these dilemmas we herein establish convergence theorems, the central result being that  $\mathcal{R}_1$  converges whenever  $|a| \neq |b|$ . Such analysis leads naturally to the conjecture that divergence occurs whenever  $a = be^{i\phi}$  with  $\cos^2 \phi \neq 1$  (which conjecture has been proven in a separate work) [Borwein et al. ] We further conjecture that for  $a/b$  lying in a certain—and rather picturesque—complex domain, we have both convergence and the truth of the AGM relation.

CIS-295588

[Almkvist, Gert](#); [Guillera, Jesús](#) Ramanujan-like Series for  $1/\pi^2$  and String Theory. [Experimental Mathematics](#) 2012 (2012).

[Article](#)

Using the machinery from the theory of Calabi–Yau differential equations, we find formulas for  $1/\pi^2$  of hypergeometric and nonhypergeometric types.

CIS-295941

[Saikia, Nipen](#) Ramanujan's Schläfli-type modular equations and class invariants  $g_n$ . [Functiones et Approximatio Commentarii Mathematici](#) 49 (2013), no. 2, 269 —281.

[Article](#)

In this paper, we use Ramanujan's Schläfli-type modular equations to find some new values of class invariants  $g_n$  and also give alternate proofs of some of known values.

CIS-305076

[Hasse, Helmut](#) Über eine diophantische Gleichung von Ramanujan-Nagell und ihre Verallgemeinerung. [Nagoya Mathematical Journal](#) 1966 (1966).

[Article](#)

CIS-307394

[Singh, V. N.](#) Certain generalized hypergeometric identities of the Rogers-Ramanujan type. II.. [Pacific Journal of Mathematics](#) 7 (1957), no. 4, 1691 —1699.

[Article](#)

CIS-318686

[Borwein, Jonathan M.](#); [Luke, D. Russell](#) Dynamics of a continued fraction of Ramanujan with random coefficients. [Abstract and Applied Analysis](#) 2005 (2005), no. 5, 449 —467.

[Article](#)

We study a generalization of a continued fraction of Ramanujan with random, complex-valued coefficients. A study of the continued fraction is equivalent to an analysis of the convergence of certain stochastic difference equations and the stability of random dynamical systems. We determine the convergence properties of stochastic difference equations and so the divergence of their corresponding continued fractions.

CIS-330194

[Bambah, R. P.](#) Ramanujan's function  $\tau(n)$ —A congruence property. [Bulletin of the American Mathematical Society](#) 53 (1947), no. 8, 764 —765.

[Article](#)

CIS-330226

[Bambah, R. P.](#); [Chowla, S.](#) Congruence properties of Ramanujan's function  $\tau(n)$ . [Bulletin of the American Mathematical Society](#) 53 (1947), no. 10, 950 —955.

[Article](#)

CIS-334119

[Andrews, George E.](#) A general theory of identities of the Rogers-Ramanujan type. [Bulletin of the American Mathematical Society](#) 80 (1974), no. 6, 1033 —1052.

[Article](#)

CIS-335980

[Askey, Richard](#) Review: Srinivasa Ramanujan, The lost notebook and other unpublished papers. [Bulletin of the American Mathematical Society](#) 19 (1988), no. 2, 558 —560.

[Article](#)

CIS-343716

[Griffin, Michael J.](#); [Ono, Ken](#); [Warnaar, S. Ole](#) A framework of Rogers–Ramanujan identities and their arithmetic properties. [Duke Mathematical Journal](#) 165 (2016), no. 8, 1475 —1527 .

[Article](#)

The two Rogers–Ramanujan  $q$ -series

$$\sum_{n=0}^{\infty} \frac{q^{n(n+\sigma)}}{(1-q)\cdots(1-q^n)}, \quad \text{\texttt{\textit{vspace}} * -3pt}$$

where  $\sigma = 0, 1$ , play many roles in mathematics and physics. By the Rogers–Ramanujan identities, they are essentially modular functions. Their quotient, the Rogers–Ramanujan continued fraction, has the special property that its singular values are algebraic integral units. We find a framework which extends the Rogers–Ramanujan identities to doubly infinite families of  $q$ -series identities. If  $a \in \{1, 2\}$  and  $m, n \geq 1$ , then we have

$$\sum_{\lambda, \lambda_1 \leq m} q^{a|\lambda|} P_{2\lambda}(1, q, q^2, \dots; q^n) = [\text{infinite product modular function}],$$

where the  $P_{\lambda}(x_1, x_2, \dots; q)$  are Hall–Littlewood polynomials. These  $q$ -series are specialized characters of affine Kac–Moody algebras. Generalizing the Rogers–Ramanujan continued fraction, we prove in the case of  $A_{2n}^{(2)}$  that the relevant  $q$ -series quotients are integral units.

CIS-344664

[Zuckerman, Herbert S.](#) Identities analogous to Ramanujan's identities involving the partition function. [Duke Mathematical Journal](#) 5 (1939), no. 1, 88 —110 .

[Article](#)

CIS-346535

[Carlitz, L.](#) Note on some continued fractions of the Rogers–Ramanujan type. [Duke Mathematical Journal](#) 32 (1965), no. 4, 713 —720 .

[Article](#)

CIS-352735

[Andrews, George E.](#) On the Rogers–Ramanujan identities and partial  $q$ -difference equations. [Illinois Journal of Mathematics](#) 1972 (1972) .

[Article](#)

CIS-376075

[Srivastava, Bhaskar](#) Asymptotic behaviour of Ramanujan's tenth order mock theta functions. [Kodai Mathematical Journal](#) 25 (2002), no. 2, 108 —112 .

[Article](#)

CIS-405949

[Cho, Bumkyu](#); [Koo, Ja Kyung](#); [Park, Yoon Kyung](#) On Ramanujan's cubic continued fraction as a modular function. [Tohoku Mathematical Journal](#) 62 (2010), no. 4, 579 —603 .

[Article](#)

We first extend the results of Chan and Baruah on the modular equations of Ramanujan's cubic continued fraction  $C(\tau)$  to all primes  $p$  by finding the affine models of modular curves and then derive Kronecker's congruence relations for these modular equations. We further show that by its singular values we can generate ray class fields modulo 6 over imaginary quadratic fields and find their class polynomials after proving that  $1/C(\tau)$  is an algebraic integer.

CIS-406510

[Chu, Y.M.](#); [Jiang, Y.P.](#); [Wang, M.K.](#) Ramanujan's cubic transformation inequalities for zero-balanced hypergeometric functions. [Rocky Mountain Journal of Mathematics](#) 46 (2016), no. 2, 679 —691 .

[Article](#)

In this paper, a generalization of Ramanujan's cubic transformation, in the form of an inequality, is proved for zero-balanced Gaussian hypergeometric function  $F(a, b; a + b; x)$ ,  $a, b > 0$ .

CIS-482742

[Bhargava, S.](#); [Mamta, D.](#); [Somashekara, D. D.](#) A NEW CONVOLUTION IDENTITY DEDUCIBLE FROM THE REMARKABLE FORMULA OF RAMANUJAN. [Taiwanese Journal of Mathematics](#) 11 (2007), no. 2, 399 —406 .

[Article](#)

In this paper we obtain a convolution identity for the coefficients  $B_n(\alpha, \theta, q)$  defined by

$$\sum_{n=-\infty}^{\infty} B_n(\alpha, \theta, q)x^n = \frac{\prod_{n=1}^{\infty} (1 + 2xq^n \cos \theta + x^2q^{2n})}{\prod_{n=1}^{\infty} (1 + \alpha q^n x e^{i\theta})},$$

using the well-known Ramanujan's  ${}_1\psi_1$ -summation formula. The work presented here complements the works of K.-W. Yang, S. Bhargava, C. Adiga and D. D. Somashekara and of H. M. Srivastava.

CIS-103397

[Li, Gang](#); [Fang, Kaitai](#) Ramanujan's  $Q$ -extension for the exponential function and statistical distributions. [Acta Mathematicae Applicatae Sinica / Yingyong Shuxue Xuebao \(English Series\)](#) 8 (1992), 264 —280 .

CIS-310619

[Fine, N. J.](#) On a system of modular functions connected with the Ramanujan identities. [Tohoku Mathematical Journal](#) 8 (1956), no. 2, 149 —164 .

[Article](#)

CIS-317574

[Zhai, Hong-Cun](#) A Note on Certain Modular Equations about Infinite Products of Ramanujan. [Abstract and Applied Analysis](#) 2013 (2013), no. 826472 .

[Article](#)

Ramanujan proposed additive formulae of theta functions that are related to modular equations about infinite products. Employing these formulae, we derived some identities on infinite products. In the same spirit, we also could present elementary and simple proofs of certain Ramanujan's modular equations on infinite products.

CIS-330195

[Bambah, R. P.](#); [Chowla, S.](#); [Gupta, H.](#) A congruence property of Ramanujan's function  $\tau(n)$ . [Bulletin of the American Mathematical Society](#) 53 (1947), no. 8, 766—767.

[Article](#)

CIS-345904

[Cohen, Eckford](#) An extension of Ramanujan's sum. III. Connections with totient functions. [Duke Mathematical Journal](#) 23 (1956), no. 4, 623—630.

[Article](#)

CIS-353779

[Andrews, George E.](#) Bailey chains and generalized Lambert series: I. Four identities of Ramanujan. [Illinois Journal of Mathematics](#) 1992 (1992).

[Article](#)

CIS-376574

[Srivastava, Bhaskar](#) Some  $\{q\}$ -identities associated with Ramanujan's continued fraction. [Kodai Mathematical Journal](#) 24 (2001), no. 1, 36—41.

[Article](#)

A continued fraction  $C(-q, q)$  is defined as a special case of a general continued fraction  $F(a, b, c, \{\lambda\}q)$ , which we have considered earlier in a separate paper. This continued fraction is also a special case of Ramanujan's continued fraction. In this paper we have found some very interesting  $q$ -identities and some identities analogous to identities given by Ramanujan involving  $G(-q, q)$  and  $H(-q, q)$  and one identity which gives the square of a continued fraction.

CIS-400855

[Liu, Zhiguo](#) Two Theta Function Identities and Some Eisenstein Series Identities of Ramanujan. [Rocky Mountain Journal of Mathematics](#) 34 (2004), no. 2, 713—732.

[Article](#)

CIS-401247

[Baruah, Nayandeep Deka](#); [Saikia, Nipen](#) Two Parameters For Ramanujan's Theta-Functions and Their Explicit Values. [Rocky Mountain Journal of Mathematics](#) 37 (2007), no. 6, 1747—1790.

[Article](#)

CIS-403553

[KATAYAMA, Koji](#) Barnes' Double Zeta Function, the Dedekind Sum and Ramanujan's Formula. [Tokyo Journal of Mathematics](#) 27 (2004), no. 1, 41—56.

[Article](#)

CIS-490290

[Bordenave, Charles](#); [Lelarge, Marc](#); [Massoulié, Laurent](#) Nonbacktracking spectrum of random graphs: Community detection and nonregular Ramanujan graphs. [The Annals of Probability](#) 46 (2018), no. 1, 1—71.

[Article](#)

A nonbacktracking walk on a graph is a directed path such that no edge is the inverse of its preceding edge. The nonbacktracking matrix of a graph is indexed by its directed edges and can be used to count nonbacktracking walks of a given length. It has been used recently in the context of community detection and has appeared previously in connection with the Ihara zeta function and in some generalizations of Ramanujan graphs. In this work, we study the largest eigenvalues of the nonbacktracking matrix of the Erdős–Rényi random graph and of the stochastic block model in the regime where the number of edges is proportional to the number of vertices. Our results confirm the “spectral redemption conjecture” in the symmetric case and show that community detection can be made on the basis of the leading eigenvectors above the feasibility threshold.

CIS-69491

[Marsaglia, John C. W.](#) The incomplete gamma function and Ramanujan's rational approximation to  $e^x$ . [Journal of Statistical Computation and Simulation](#) 24 (1986), 163—168.

CIS-294654

[Bochnak, J.](#); [Oh, B.-K.](#) Almost-universal quadratic forms: An effective solution of a problem of Ramanujan. [Duke Mathematical Journal](#) 147 (2009), no. 1, 131—156.

[Article](#)

In this article we investigate almost-universal positive-definite integral quaternary quadratic forms, that is, those representing sufficiently large positive integers. In particular, we provide an effective characterization of all such forms. In this way we obtain the final solution to a problem first addressed by Ramanujan in [12]. Special attention is given to 2-anisotropic almost-universal quaternaries

CIS-305328

[Zhang, Wenpeng](#) On a hybrid mean value of certain Hardy sums and Ramanujan sum. [Osaka Journal of Mathematics](#) 40 (2003), no. 2, 365—373.

[Article](#)

CIS-308880

[Forrester, Peter J.](#) Extensions of several summation formulae of Ramanujan using the calculus of residues. [Rocky Mountain Journal of Mathematics](#) 13 (1983), no. 4, 557—572.

[Article](#)

CIS-5676

[Jogdeo, Kumar](#); [Samuels, S. M.](#) Monotone convergence of binomial probabilities and a generalization of Ramanujan's equation. [The Annals of Mathematical Statistics](#) 39 (1968), 1191—1195.

[Article](#)

Let the following expressions denote the binomial and Poisson probabilities,



$$\begin{aligned} & \sum_{j=0}^k b(j; n, p) \sum_{j=0}^k \binom{n}{j} p^j (1-p)^{n-j}, \\ & P(k; \lambda) \end{aligned}$$

Section 2 contains two basic theorems which generalize results of Anderson and Samuels [1] and Jogdeo [7]. These two theorems serve as lemmas for the more detailed results of Sections 3 and 4. Section 3 is devoted to a study of the median number of successes in Poisson trials (i.e. independent trials where the success probability may vary from trial to trial). The study utilizes a method first introduced by Tchebychev [12], generalized by Hoeffding [6], and used by Darroch [5] and Samuels [10]. The results correspond to those for the modal number of successes obtained by Darroch. Ramanujan (see [8]) considered the following equation, where  $n$  is a positive integer:

$$\frac{1}{2} = P(n-1; n) + y_n p(n; n), \quad (1.3)$$

and correctly conjectured that  $\frac{1}{3} < y_n < \frac{1}{2}$ . In Section 4 we show that for the corresponding binomial equation,

$$\frac{1}{2} = B(k-1; n, k/n) + z_{k,n} b(k; n, k/n), \quad (1.4)$$

$\frac{1}{3} < z_{k,n} < \frac{2}{3}$  and, for each  $k$  and for  $n \geq 2k$ ,  $z_{k,n}$  decreases to  $y_k$  as  $n \rightarrow \infty$ .

CIS-328568

[Lehmer, D. H.](#) An application of Schläfli's modular equation to a conjecture of Ramanujan. [Bulletin of the American Mathematical Society](#) 44 (1938), no. 2, 84—90.

[Article](#)

CIS-330196

[Bambah, R. P.](#); [Chowla, S.](#) A new congruence property of Ramanujan's function  $\tau(n)$ . [Bulletin of the American Mathematical Society](#) 53 (1947), no. 8, 768—769.

[Article](#)

CIS-335759

[Shahidi, Freydoon](#) A weak Ramanujan conjecture for generic cuspidal spectrum of quasi-split groups. [Bulletin of the American Mathematical Society](#) 15 (1986), no. 2, 195—200.

[Article](#)

CIS-346147

[Sugunamma, M.](#) Eckford Cohen's generalizations of Ramanujan's trigonometrical sum  $C(n, r)$ . [Duke Mathematical Journal](#) 27 (1960), no. 3, 323—330.

[Article](#)

CIS-389631

[Srivastava, H. M.](#) A note on a generalization of a  $q$ -series transformation of Ramanujan. [Proceedings of the Japan Academy, Series A, Mathematical Sciences](#) 63 (1987), no. 5, 143—145.

[Article](#)

CIS-390524

[Duverney, Daniel](#); [Nishioka, Keiji](#); [Nishioka, Kumiko](#); [Shiokawa, Iekata](#) Transcendence of Rogers-Ramanujan continued fraction and reciprocal sums of Fibonacci numbers. [Proceedings of the Japan Academy, Series A, Mathematical Sciences](#) 73 (1997), no. 7, 140—142.

[Article](#)

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# Current Index to Statistics ▼




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CIS-78493

[Almkvist, Gert](#); [Berndt, Bruce](#) Gauss, Landen, Ramanujan, the arithmetic-geometric mean, ellipses,  $\pi$ , and the Ladies Diary. [The American Mathematical Monthly](#) 95 (1988), 585 —608 .

CIS-7059

Stochastic Processes and Their Applications. Proceedings of the Third Ramanujan Symposium 1993-94. (1995) .

CIS-121382

[Choi, K. P.](#) On the medians of Gamma distributions and an equation of Ramanujan (STMA V36 0124). [Proceedings of the American Mathematical Society](#) 121 (1994), 245 —251 .

CIS-502197

[Bhamidi, Shankar](#); [Evans, Steven N.](#); [Peled, Ron](#); [Ralph, Peter](#) Brownian motion on disconnected sets, basic hypergeometric functions, and some continued fractions of Ramanujan. (2008) , 42 —75 .

CIS-503721

[Bhamidi, Shankar](#); [Evans, Steven N.](#); [Peled, Ron](#); [Ralph, Peter](#) Brownian motion on disconnected sets, basic hypergeometric functions, and some continued fractions of Ramanujan. [Institute of Mathematical Statistics Collections](#) 2008 (2008) , no. 193940307000000383 , 42 —75 .

[Article](#)

Motivated by Lévy's characterization of Brownian motion on the line, we propose an analogue of Brownian motion that has as its state space an arbitrary closed subset of the line that is unbounded above and below: such a process will be a martingale, will have the identity function as its quadratic variation process, and will be "continuous" in the sense that its sample paths don't skip over points. We show that there is a unique such process, which turns out to be automatically a reversible Feller-Dynkin Markov process. We find its generator, which is a natural generalization of the operator  $f \mapsto \frac{1}{2}f''$ .

We then consider the special case where the state space is the self-similar set  $\{\pm q^k: k \in \mathbb{Z}\} \cup \{0\}$  for some  $q > 1$ . Using the scaling properties of the process, we represent the Laplace transforms of various hitting times as certain continued fractions that appear in Ramanujan's "lost" notebook and evaluate these continued fractions in terms of basic hypergeometric functions (that is,  $q$ -analogues of classical hypergeometric functions). The process has 0 as a regular instantaneous point, and hence its sample paths can be decomposed into a Poisson process of excursions from 0 using the associated continuous local time. Using the reversibility of the process with respect to the natural measure on the state space, we find the entrance laws of the corresponding Itô excursion measure and the Laplace exponent of the inverse local time – both again in terms of basic hypergeometric functions. By combining these ingredients, we obtain explicit formulae for the resolvent of the process. We also compute the moments of the process in closed form. Some of our results involve  $q$ -analogues of classical distributions such as the Poisson distribution that have appeared elsewhere in the literature.

CIS-352831

[Moreno, Carlos Julio](#) A necessary and sufficient condition for the Riemann hypothesis for Ramanujan's zeta function. [Illinois Journal of Mathematics](#) 1974 (1974) .

[Article](#)

CIS-80845

[Verma, A. ; Jain, V. K.](#) Some quadratic transformations of basic hypergeometric series and identities in Ramanujan's 'lost' note book. [Indian Journal of Pure and Applied Mathematics](#) 19 (1988) , 768 —785 .

CIS-149310

[Parthasarathy, P. R. ; Lenin, R. B. ; Schoutens, W. ; van Assche, W.](#) A birth and death process related to the Rogers-Ramanujan continued fraction (STMA V40 1039). [Journal of Mathematical Analysis and Applications](#) 224 (1998) , 297 —315 .

CIS-330452

[Cheng, Tseng Tung.](#) The normal approximation to the Poisson distribution and a proof of a conjecture of Ramanujan. [Bulletin of the American Mathematical Society](#) 55 (1949) , no. 4 , 396 —401 .

[Article](#)

CIS-344377

[Sarveniazi, Alireza](#) Explicit construction of a Ramanujan  $(n_1, n_2, \dots, n_{d-1})$ -regular hypergraph. [Duke Mathematical Journal](#) 139 (2007) , no. 1 , 141 —171 .

[Article](#)

Using the main properties of the skew polynomial rings  $\mathbb{F}_{q^d}\{\tau\}$  and some related rings, we describe the explicit construction of Ramanujan hypergraphs, which are certain simplicial complexes introduced in the author's thesis [29] (see also [30]) as generalizations of Ramanujan graphs. Such hypergraphs are described in terms of Cayley graphs of various groups. We give an explicit description of our hypergraph as the Cayley graph of the groups  $\mathrm{PSL}_d(\mathbb{F}_r)$  and  $\mathrm{PGL}_d(\mathbb{F}_r)$  with respect to a certain set of generators, over a finite field  $\mathbb{F}_r$  with  $r$  elements

CIS-295916

[Lalín, Matilde N. ; Rogers, Mathew D.](#) Variations of the Ramanujan polynomials and remarks on  $\zeta(2j+1)/\pi^{2j+1}$ . [Functiones et Approximatio Commentarii Mathematici](#) 48 (2013) , no. 1 , 91 —111 .

[Article](#)

We observe that five polynomial families have all of their roots on the unit circle. We prove the statements explicitly for four of the polynomial families. The polynomials have coefficients which involve Bernoulli numbers, Euler numbers, and the odd values of the Riemann zeta function. These polynomials are closely related to the Ramanujan polynomials, which were recently introduced by Murty, Smyth and Wang [MSW]. Our proofs rely upon theorems of Schinzel [S], and Lakatos and Losonczai [LL] and some generalizations.

CIS-327047

[Bell, E. T.](#) Review: G. H. Hardy, P. V. Seshu Aiyar and B. M. Wilson, Collected Papers of Srinivasa Ramanujan. [Bulletin of the American Mathematical Society](#) 34 (1928) , no. 6 , 783 —784 .

[Article](#)

CIS-183792

[Alm, Sven Erick ; Erick Alm, Sven](#) Monotonicity of the difference between median and mean of gamma distributions and of a related Ramanujan sequence. [Bernoulli](#) 9 (2003) , no. 2 , 351 —371 .

**Keywords:** [Poisson distribution](#)

[Article](#)

For  $n \geq 0$ , let  $\lambda_n$  be the median of the  $\Gamma(n+1, 1)$  distribution. We prove that the sequence  $\{\alpha_n = \lambda_n - n\}$  decreases from  $\log 2$  to  $\frac{2}{3}$  as  $n$  increases from 0 to  $\infty$ . The difference,  $1 - \alpha_n$ , between the mean and the median thus increases from  $1 - \log 2$  to  $\frac{1}{3}$ . This result also proves a conjecture by Chen and Rubin about the Poisson distributions: if  $Y_\mu \sim \mathrm{Poisson}(\mu)$ , and  $\lambda_n$  is the largest  $\mu$  such that  $P(Y_\mu \leq n) = \frac{1}{2}$ , then  $\lambda_n - n$  is decreasing in  $n$ . The sequence  $\{\alpha_n\}$  is related to a sequence  $\{\theta_n\}$ , introduced by Ramanujan, which is known to be decreasing and of the form  $\theta_n = \frac{1}{3} + 4/(135(n + k_n))$ , where  $\frac{1}{2} \leq k_n < 1$

CIS-492237

[Ramakrishnan, B. ; Sahu, Brundaban ; Singh, Anup Kumar](#) On the number of representations of certain quadratic forms and a formula for the Ramanujan Tau function. [Functiones et Approximatio Commentarii Mathematici](#) 58 (2018) , no. 2 , 233 —244 .

[Article](#)

In this paper, we find the number of representations of the quadratic form  $x_1^2 + x_1x_2 + x_2^2 + x_3^2 + x_3x_4 + x_4^2 + \dots + x_{2k-1}^2 + x_{2k-1}x_{2k} + x_{2k}^2$ , for  $k = 7, 9, 11, 12, 14$  using the theory of modular forms. By comparing our formulas with the formulas obtained by G.A. Lomadze, we obtain the Fourier coefficients of certain newforms of level 3 and weights 7, 9, 11 in terms of certain finite sums involving the solutions of similar quadratic forms of lower variables. In the case of 24 variables, comparison of these formulas gives rise to a new formula for the Ramanujan tau function.

CIS-400680

[Milne, Stephen C.](#); [Schlosser, Michael](#) A New  $A_n$  Extension of Ramanujan's  ${}_1\psi_1$  Summation with Applications to Multilateral An Series. [Rocky Mountain Journal of Mathematics](#) 32 (2002) , no. 2 , 759 —793 .

[Article](#)

CIS-391243

[Forrester, Peter J.](#); [Ito, Masahiko](#) Ramanujan's  ${}_1\psi_1$  summation theorem —perspective, announcement of bilateral  $q$ -Dixon–Anderson and  $q$ -Selberg integral extensions, and context—. [Proceedings of the Japan Academy, Series A, Mathematical Sciences](#) 90 (2014) , no. 7 , 92 —97 .

[Article](#)

The Ramanujan  ${}_1\psi_1$  summation theorem is studied from the perspective of Jackson integrals,  $q$ -difference equations and connection formulae. This is an approach which has previously been shown to yield Bailey's very-well-poised  ${}_6\psi_6$  summation. Bilateral Jackson integral generalizations of the Dixon–Anderson and Selberg integrals relating to the type  $A$  root system are identified as natural candidates for multidimensional generalizations of the Ramanujan  ${}_1\psi_1$  summation theorem. New results of this type are announced, and furthermore they are put into context by reviewing from previous literature explicit product formulae for Jackson integrals relating to other roots systems obtained from the same perspective.

CIS-420542

Erratum for Michael J. Griffin, Ken Ono, and S. Ole Warnaar, "A framework of Rogers--Ramanujan identities and their arithmetic properties," *Duke Math. J.*, Volume 165, Number 8 (2016), 1475--1527. [Duke Mathematical Journal](#) 2016 (2016) , no. 3713999 .

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