LIST OF PUBLICATIONS
O-Yeat Chan

1. O-Y. Chan, G. Choi, and A. Zaharescu, *A multidimensional version of a result of Davenport-Erdös*, J. Integer Seq. **6** (2003), no. 2, Article 03.2.6, 9 pp.

   Abstract. Davenport and Erdős showed that the distribution of values of sums of the form
   $$S_h(x) = \sum_{m=x+1}^{x+h} \left(\frac{m}{p}\right),$$
   where p is a prime and $\left(\frac{m}{p}\right)$ is the Legendre symbol, is normal as $h, p \to \infty$ such that $\frac{\log h}{\log p} \to 0$. We prove a similar result for sums of the form
   $$S_h(x_1, \ldots, x_n) = \sum_{z_1=x_1+1}^{x_1+h} \cdots \sum_{z_n=x_n+1}^{x_n+h} \left(\frac{z_1 + \cdots + z_n}{p}\right).$$

2. O-Y. Chan, *Some asymptotics for cranks*, Acta Arith., **120** (2005), no. 2, 107–143.

   Abstract. We use the circle method to find asymptotic formulas for sequences generated by certain quotients of theta functions related to cranks of partitions. These formulas allow us to prove conjectures of B. C. Berndt, H. H. Chan, S. H. Chan, and W.–C. Liaw regarding monotonicity of these sequences, as well as to prove the completeness of tables of values for these sequences found on pages 179 and 180 of Ramanujan's Lost Notebook. We also prove a conjecture of G. E. Andrews and R. Lewis regarding the signs of the difference of the number of partitions of a number n with crank congruent to 0 modulo 4 minus the number of partitions of n with crank congruent to 2 modulo 4.

3. M. Beck, B. C. Berndt, O-Y. Chan, and A. Zaharescu, *Determinations of analogues of Gauss sums and other trigonometric sums*, Int. J. Number Theory, **1** (2005), no. 3, 333–356.

   Abstract. Explicit determinations of several classes of trigonometric sums are given. These sums can be viewed as analogues or generalizations of Gauss sums. In a previous paper, two of the present authors considered primarily sine sums associated with primitive odd characters. In this paper, we establish two general theorems involving both sines and cosines, with more attention given to cosine sums in the several examples that we provide.

4. O-Y. Chan and J. Smoak, *More designer decimals: the integers and their geometric extensions*, College Math. J., **37** (2006), no. 5, 355–363.

   Abstract. The fraction 10000/9801 has an intriguing decimal expansion, namely 1.02030405... In this paper, we investigate the properties of this fraction via an arithmetical approach. The approach also yields a class of fractions whose decimal expansions involve higher dimensional analogues of the integers. We also obtain fractions corresponding to other sequences via generating functions.

5. O-Y. Chan, *Weighted trigonometric sums over a half-period*, Adv. Appl. Math., **38** (2007), no. 4, 482–504.

   Abstract. We derive formulas for evaluating weighted sums of trigonometric functions over evenly-spaced angles in the first quadrant. These results generalize those of a previous paper, where we considered trigonometric sums weighted by real, non-principal Dirichlet characters.

6. B. C. Berndt, O-Y. Chan, S.-G. Lim, A. Zaharescu, *Questionable claims found in Ramanujan's Lost Notebook*, in *Tapas in Experimental Mathematics*, T. Amdeberhan and V. Moll, eds., Contemporary Math. **457**, Amer. Math. Soc., (2008) 69–98.

   Summary. We consider three questionable identities from pages 335 and 336 of Ramanujan's Lost Notebook. While we do not have corrected versions of these identities, we provide some analysis which we hope will provide ideas and insights to others and lead to finding the corrected versions.

7. D. Borwein, J. M. Borwein, and O-Y. Chan, *The evaluation of Bessel functions via exp-arc integrals*, J. Math. Anal. Appl., **341** (2008) 478–500.

   Abstract. A standard method for computing values of Bessel functions has been to use the well-known ascending series for small argument, and to use an asymptotic series for large argument; with the choice of the series changing at some appropriate argument magnitude, depending on the number of digits required. In a recent paper, D. Borwein, J. Borwein, and R. Crandall derived a series for an "exp-arc" integral which gave rise to an absolutely convergent series for the J and I Bessel functions with integral order. Such series can be rapidly evaluated via recursion and elementary operations, and provides a viable alternative to the conventional ascending-asymptotic switching. In the present work, we extend the method to deal with Bessel functions of general (non-integral) order, as well as to deal with the Y and K Bessel functions.

8. J. M. Borwein and O-Y. Chan, *Uniform bounds for the complementary incomplete gamma function*, Math. Ineq. Appl. **12** (2009) 115–121.

   Abstract. We prove upper and lower bounds for the complementary incomplete gamma function $\Gamma(a, z)$ with complex parameters a and z. Our bounds are refined within the circular hyperboloid of one sheet $\{(a, z) : |z| > c|a - 1|\}$ with a real and z complex. Our results show that within the hyperboloid, $|\Gamma(a, z)|$ is of order $|z|^{a-1}e^{-\Re(z)}$, and extends an upper estimate of Natalini and Palumbo to complex values of z.

9. J. M. Borwein and O-Y. Chan, *Duality in tails of multiple zeta values*, Int. J. Number Theory, (2009), 13 pp. To appear.

   Abstract. Duality relations are deduced for tails of multiple zeta values using elementary methods. These formulas extend the classical duality formulas for multiple zeta values.

10. O-Y. Chan and D. V. Manna, *Congruences for Stirling numbers of the second kind*, in *Gems in Experimental Mathematics*, Contemporary Math. **517**, Amer. Math. Soc., (2010), 97–111.

    Abstract. We characterize the Stirling numbers of the second kind $S(n,k)$ modulo prime powers in terms of binomial coefficients. Our results are surprisingly simple when k is a multiple of the modulus.

11. J. M. Borwein, O-Y. Chan, and R. Crandall, *Higher-dimensional box integrals*, Exp. Math, (2010), 24 pp. To appear. **Abstract.** Herein, with the aid of substantial symbolic computation, we solve previously open problems in the theory of n-dimensional box integrals $B_n(s) := \langle |\vec{r}|^s \rangle$; $\vec{r} \in [0,1]^n$. In particular we resolve an elusive integral called $\mathcal{K}_5$ that previously acted as a "blockade" against closed-form evaluation in $n = 5$ dimensions. In consequence we now know that $B_n(\text{integer})$ can be given a closed form for $n = 1, 2, 3, 4, 5$. We also find the general residue at the pole at $s = -n$, this leading to new relations and definite integrals—for example, we are able to give the first nontrivial closed forms for 6-dimensional box integrals and to show hyperclosure of $B_6(\text{even})$. The Clausen function and its generalizations play a central role in these higher-dimensional evaluations. Our results provide stringent test scenarios for symbolic-algebra simplification methods.

12. O-Y. Chan and P. Prałat, *Chipping away at the edges: how long does it take?*, (2010), 16 pp. Submitted.

    Abstract. We introduce the single-node traffic flow process, which is related to both the chip-firing game and the edge searching process. Initially, real-valued weights (instead of chips) are placed on some vertices, and all the edges have zero weight. When a vertex is "fired", the whole content accumulated in this vertex is sent uniformly to all its neighbours, and each edge increases its weight by the amount that is sent through this edge. We would like to discover the shortest firing sequence such that the total amount of traffic that has passed through each edge is at least some fixed value. A complete characterization for complete graphs is presented as well as discussion of other classes of graphs.