

CMS

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FROM THE PRESIDENT'S DESK



Jonathan Borwein

A General Reprise

The year 2001 saw the Society as busy as usual. As President, I again wish to remind you how hard and effectively our Executive Office continues to work and at how many activities the Society is engaged in. The Executive Director's Report, published in the April Notes, details changes in the Executive Office.

Whether we choose the comparison with other Canadian Academic Societies or with foreign Mathematical Societies, we take some considerable pleasure in both the scale and level of function we provide. Activities included annual meetings and prizes, active publication programme, sponsored high school competitions and Math Camps (there 11 in 2001 in seven provinces), the Endowment Fund Grants Competition

“which has just completed its third set (first full cycle) of awards funding worthy mathematical projects ... and much else.” *Information on the Competition can be found via Camel: www.cms.math.ca/Grants/.*

Central, as always, to last year's activities were the Summer and Winter Meetings, again aided by the generous support of the National Programme Committee of the three Canadian Research Institutes (Fields, CRM and PIMS) and the Mathematics of Information Technology and Complex Systems Network (MITACS NCE).

CMS 2001 Meetings

The 2001 Canadian Mathematical Society's Summer Meeting was hosted by the University of Saskatchewan, from June 2–4, 2001. Our meetings, in addition to their scientific merit, were an excellent way to build and maintain friendships within the mathematical community. Following our now usual format, the meeting included ten symposia, contributed papers, four plenary speakers, and two Prize lectures. The **Jeffery-Williams Lecture** was given by David Boyd, University of British Columbia, the second Coxeter-James lecturer in 1979. The symposium on Number Theory was organized in honour of David who also turned 60 in 2001. The **Krieger-Nelson Lecture** was given by Lisa Jeffrey, University of Toronto. There were four plenary speakers: Georgia Benkart (Wisconsin), Zoe Chatzidakis (Paris 7),

(see PRESIDENT–page 17)

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NOTES DE LA SMC

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EDITORIAL



Peter Fillmore

What does the future hold for the CMS? In several areas—publication and meetings come to mind—the Society has been extraordinarily successful, whether measured against mathematical societies abroad or other scientific societies in Canada. Our publication program leads the way at home, and abroad is surpassed by only the AMS, the LMS, and one or two European societies. Likewise our program of national meetings is more extensive than in the other sciences in Canada, many of which seem to prefer specialist meetings with their American counterparts.

But in other areas the record is much less clear. Amid the turmoil surrounding mathematics curricula and teaching in the schools, the Society has yet to find its voice. Worse, we have simply abandoned the annual employment survey. These are but two of the areas in which we have a legitimate interest, perhaps even a social responsibility.

These ruminations are prompted by the open letter in this issue, prepared by CMS stalwarts Edgar Goodaire and Ed Williams. They point out that only 40% of academic mathematicians in Canada belong to the CMS, and they want to know why. The Society is just completing a multi-year study of all aspects of our enterprise, and this should provide some clues. But it is clear that the search for relevance to the other 60% of

our colleagues—to say nothing of non-university mathematicians—will be an on-going one.

Que réserve l'avenir à la SMC? Dans plusieurs domaines (notamment la publication et les Réunions), la Société réussit extraordinairement bien, qu'on la compare à des sociétés mathématiques étrangères ou à d'autres sociétés scientifiques canadiennes. Notre programme de publication est le premier au pays, et n'est devancé à l'étranger que par l'AMS, la LMS, et une ou deux autres sociétés européennes. Notre programme de réunions nationales est aussi plus exhaustif que celui des autres sociétés scientifiques canadiennes, dont bon nombre semblent préférer des rencontres de spécialistes avec leurs homologues américains.

Mais dans d'autres domaines, la situation est beaucoup moins claire. Au milieu du brouhaha entourant les programmes de mathématiques et leur enseignement dans les écoles, la Société n'a pas encore trouvé sa voix. Pis encore, nous avons tout simplement abandonné le sondage annuel sur la profession. Ce sont là deux des nombreux sujets qui nous intéressent particulièrement et pour lesquels nous avons peut-être même une responsabilité sociale.

Ces réflexions me sont venues à la lecture de la lettre ouverte de deux piliers de la SMC, MM. Edgar Goodaire et Ed Williams, publiée dans ce numéro. Ils nous apprennent que seulement 40 % des mathématiciens du milieu universitaire sont membres de la SMC et s'interrogent sur cette découverte. La Société termine en ce moment un examen de tous les aspects de ses activités, qui s'est étalé sur plusieurs années, et cette réflexion pourrait nous donner quelques pistes. Il est clair, cependant, que notre désir d'intéresser à la SMC les 60 % de nos collègues qui n'en sont pas membres - sans parler des mathématiciens non issus du milieu universitaire - reviendra souvent à la surface.

Why Don't More Canadian Mathematicians Support their Society?

Pourquoi les mathématiciens canadiens ne sont-ils pas plus nombreux à soutenir leur Société?

An Open Letter to the CMS Membership / Lettre ouverte aux membres de la SMC

by/par Edgar G. Goodaire and/et Edgar R. Williams,
Memorial University of Newfoundland/ Université Memorial (Terre-Neuve)

One of us is a CMS Vice-President and the other a member of the CMS Committee on the Advancement of Mathematics, which has recently also taken on the responsibilities of the now-defunct fundraising committee. Both of us are keenly concerned about the long-term financial health of our Society. Why don't more Canadian mathematicians belong to their national organization? When we started our careers, joining our national professional society seemed like the most natural thing in the world, but the situation today appears to have changed. People are retiring, leaving the CMS, and not being replaced by memberships from new faculty. We have recently spent considerable time looking over faculty lists of most Canadian mathematics departments and comparing with CMS membership data. Even at a university like our own, which is often credited with providing more than average support to the CMS, we were surprised to discover that less than half of those colleagues whom we would expect to belong to the CMS are actually members. Why is this? We're going to start asking this question here and urge you to do the same at your own universities. The responses we get might make interesting reading in these pages and provide some hints as to what we could be doing to make the CMS more attractive.

Since its inception in 1945, the CMS has played a vital role in the development of mathematics in Canada, a role which spans the spectrum from school mathematics to university research to linkages with industry to promoting Canadian mathematics within the International Mathematical Union. The CMS support of mathematics competitions at the provincial level, the Canadian Math Olympiad and the International Math Olympiad is well known. Equally important is the strong support which the Society gives the three national institutes, the Fields Institute, the Centre de Recherche Mathématiques and the Pacific Institute for the Mathematical Sciences. Arguably, without the CMS, there would be no PIMS and no Banff International Research Station today. Without the backing of a stable organization with resources, it is doubtful if Canadians could have marshalled the successful defense of funding decisions at NSERC in 1994. These "resources", of course, have their genesis in membership fees.

At CDN \$82 or CDN \$130 per annum (depending on annual salary), our membership fees seem like a bargain compared with the AMS (US \$105 or US \$140), the MAA (US \$144) or SIAM (US \$105). At \$2000, our lifetime rate is very low (especially for our younger colleagues!). Bear in mind that many of us have professional development funds from

which dues can be paid. Moreover, by virtue of a reciprocity agreement with the AMS, any CMS member living outside the US can join the AMS for half price. It's hard to argue that the cost of a membership is a deterrent to people joining the CMS.

We include a table (overleaf) which shows numbers of faculty in a sampling of Canadian mathematics departments with those who are CMS members. The numbers are only approximate. We tried hard not to skew the data by removing statisticians and those whose interests in applied mathematics made them, in our view, unlikely CMS members.

Would a CMS membership prize help increase membership? Suppose we offered a partial rebate of membership fees to departments who increase their net membership in the CMS over a one year period, the rebate intended to go to students in some form or other. There must be ways to increase membership. Please send us your views on the title of this piece and related issues (edgar@math.mun.ca and ewilliam@math.mun.ca).

L'un de nous est vice-président de la SMC, l'autre est membre du Comité de la SMC sur l'avancement des mathématiques, dont le mandat reprend aussi depuis peu celui du comité de financement, maintenant dissout. Nous sommes tous les deux très inquiets de la santé financière à long terme de notre Société. Pourquoi les mathématiciens canadiens ne sont-ils pas plus nombreux à adhérer à leur association nationale? Au début de nos carrières, l'adhésion à notre société professionnelle nationale semblait toute naturelle, mais on dirait que ce n'est plus le cas aujourd'hui. De nombreux mathématiciens prennent leur retraite, quittent la SMC et ne sont pas remplacés par de nouveaux professeurs. Dernièrement, nous avons passé beaucoup de temps à comparer les listes de professeurs de la plupart des départements de mathématiques des universités canadiennes avec les listes de membres de la SMC. Même dans une université comme la nôtre, souvent reconnue pour donner un appui supérieur à la moyenne à la SMC, nous avons été étonnés de constater que moins de la moitié des personnes que nous nous attendions à voir figurer sur les listes étaient membres. Comment expliquer une telle situation? Nous allons commencer à poser la question dans notre université, et nous vous encourageons fortement à faire de même chez vous. Les réponses que nous obtiendrons ainsi pourraient nous fournir des articles intéressants pour les Notes et nous donner quelques pistes ou moyens qui nous permettraient de rendre la SMC plus attrayante.

Depuis sa fondation en 1945, la SMC joue un rôle vital dans l'avancement des mathématiques au Canada. Sa sphère d'activité va de la promotion des mathématiques au primaire et au secondaire à la recherche universitaire, en passant par les relations avec l'industrie et la promotion des mathématiques canadiennes au sein de l'Union mathématique internationale. La SMC appuie, c'est bien connu, des concours mathématiques provinciaux, l'Olympiade mathématique du Canada et l'Olympiade internationale de mathématiques. Autre élément tout aussi important : la Société donne son appui aux trois instituts nationaux (Fields, Centre de recherche mathématique, PIMS). Il ne fait nul doute que sans la SMC, le PIMS et la Station de recherche internationale de Banff n'existeraient pas. Sans le soutien d'un organisme stable muni de ressources, il est peu probable que les mathématiciens canadiens aient pu orchestrer la stratégie qui a fait pencher les décisions de financement du CRSNG en leur faveur en 1994. Ces « ressources », évidemment, proviennent des droits d'adhésion.

À 82 \$CAN ou 130 \$CAN par année (selon le revenu annuel), nos droits d'adhésion sont une vraie aubaine si on les compare à ceux de l'AMS (105 \$US ou 140 \$US), de la MAA (144 \$US) ou de la SIAM (105 \$US). Et à 2 000 \$CAN, notre tarif d'adhésion à vie est très bas (surtout pour les jeunes!)

Il ne faut pas oublier non plus que bon nombre d'entre nous disposons de fonds de perfectionnement qui peuvent servir à payer ces droits. Qui plus est, grâce à une entente de réciprocité avec l'AMS, les membres de la SMC peuvent adhérer à l'AMS à moitié prix. Il est donc difficile de croire que les droits d'adhésion nuisent au recrutement de membres.

À titre indicatif, nous avons ajouté ci-dessous un tableau montrant le nombre de professeurs d'un échantillon de départements d'universités canadiennes et le nombre de membres de la SMC. Il s'agit là de chiffres approximatifs. Pour obtenir les données les plus justes possibles, nous n'avons pas compté les statisticiens ni les personnes dont les intérêts pour les mathématiques appliquées rendait peu probable, à notre avis, l'adhésion à la SMC.

Pourrions-nous augmenter le nombre d'adhésions en créant un « prix des membres »? Et si nous offrions une réduction des droits d'adhésion aux départements qui accroissent leur nombre de membres à la SMC pendant un an, et que la réduction revienne aux étudiants, sous une forme ou une autre? Il doit y avoir des moyens d'attirer plus de membres. Nous aimerions beaucoup avoir votre avis sur le sujet, ou recevoir des réponses au titre du présent article. Écrivez-nous à edgar@math.mun.ca ou à ewilliam@math.mun.ca.

University/Université	CMS Members/Membres de la SMC		
	Potential/Potentiels	Actual/Réels	Percentage/Pourcentage
A	47	20	43%
B	10	6	60%
C	9	4	44%
D	22	10	45%
E	64	26	41%
F	78	20	26%
G	16	7	44%
H	31	13	42%
I	12	3	25%
J	33	15	45%
K	10	5	50%
L	26	13	50%
M	54	22	41%
N	15	4	27%
O	29	13	45%
P	39	16	41%
Q	19	8	42%
R	25	7	28%
S	23	13	57%
T	9	2	22%
U	30	15	50%
V	19	9	47%
W	50	20	40%
X	22	7	32%
Y	29	10	34%
Z	20	10	50%
Total	741	298	40%

Hydrodynamic Limits and Related Topics

Book Review by Ellen Saada, l'Université de Rouen

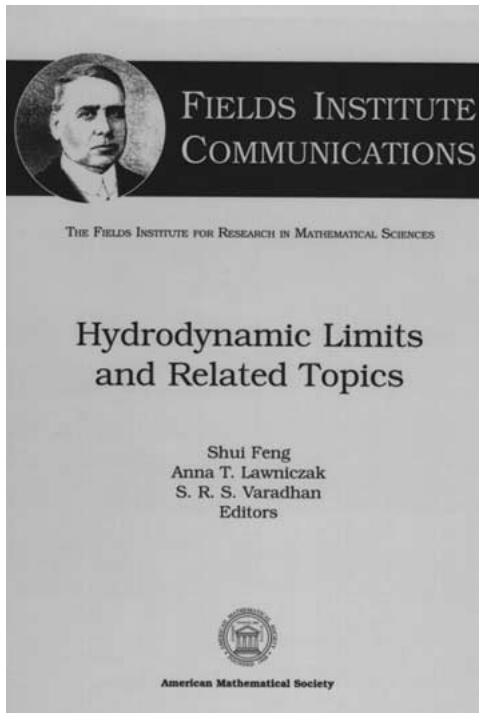
Hydrodynamic Limits and Related Topics

edited by Shui Feng et al.

Fields Institute Communications, vol 27,

AMS, 2000

152 pp



This book is an account of a mini-course called *Lectures on Hydrodynamic Scaling* by S.R.S. Varadhan, followed by a workshop on “Hydrodynamic Limits”, both held in October 1998, at the Fields Institute for Research in Mathematical Sciences in Toronto, Canada.

In this report, we mainly focus on Part I of the book, containing the notes by S.R.S. Varadhan. Part II is devoted to papers by the speakers and contributors to the workshop; for each contribution we give the title and author.

Part I

Investigation of hydrodynamic limits began in the early 1980’s. However, the two papers that initiated the development of a new theory, by introducing entropy techniques and large deviations to derive hydrodynamic equations, were

[GPV] Guo M.Z., Papanicolaou G.C., Varadhan S.R.S. : Nonlinear Diffusion Limit for a System with Nearest Neighbor Interactions. *Comm. Math. Phys.* **118** (1988), 31–59.

[KOV] Kipnis C., Olla S., Varadhan S.R.S. : Hydrodynamics and Large Deviations for Simple Exclusion Processes. *Comm. Pure Appl. Math.* **XVII** (1989), 115–137.

In this mini-course of six lectures, S.R.S. Varadhan conveys the main concepts and key technical points of this theory in an enlightening way, thanks to his deep understanding. The example in lecture 1 gives an insight on the issues to cope with. In lectures 2 to 6, through the analysis of an interacting particle system, the simple exclusion process (SEP), are explained gradient and non-gradient tools, and the relative entropy method.

Lecture 1. “From classical mechanics to Euler equations”. Quoting S.R.S. Varadhan, *The basic example of hydrodynamic scaling is naturally hydrodynamics itself* (we write quotations in italics). In R^3 , $N \simeq \bar{\rho}l^3$ classical particles evolve in a periodic cube of side l , according to a classical Hamiltonian dynamical system, with 5 conserved quantities (among which the total number N of particles). To each one corresponds a macroscopic quantity: after rescaling space and time by a factor of l (the *hydrodynamic scaling*), is written, then formally derived, a field (e.g. the density field). Taking limits in l would give a *hydrodynamic equation*. But this requires to replace microscopic terms appearing in the derivative by their space-time averages w.r.t. equilibrium distributions, through an ergodic theorem, not available for such systems. This leads us to consider stochastic dynamics instead of deterministic ones.

Lecture 2. “Some examples”. After the intermediate example of hydrodynamics for noninteracting particles undergoing independent motions, the SEP is introduced. It is an interacting particle system of state space $X = \{0, 1\}^S$, the set of sites S is either \mathbb{Z}^d or \mathbb{Z}_N^d (the quotient obtained from \mathbb{Z}^d by considering each coordinate modulo N ; we reduce ourselves to this latter case), N will be the scaling parameter. There is at most one particle per site, and for a configuration $\eta \in X$, $\eta(x) = 1$ (resp. $\eta(x) = 0$) means that site x is occupied by a particle (resp. is empty). For the evolution, each site is endowed with a mean one exponential clock, the clocks being mutually independent. When the clock at site x rings, if a particle is present on x , it chooses randomly a site y according to a translation invariant probability distribution $p(y - x)$ with finite support, and jumps to that site if y is empty; otherwise nothing happens.

This description corresponds to a Markov process, with infinitesimal generator defined for a local function f (i.e. which depends on a finite number of coordinates) by

$$(\mathcal{A}f)(\eta) = \sum_{x,y \in S} \eta(x)(1 - \eta(y))p(y - x)[f(\eta^{x,y}) - f(\eta)]$$

where $\eta^{x,y}$ is configuration η with occupations at sites x and y exchanged.

Since particles only jump, their total number is a conserved quantity. The Bernoulli product measures μ_ρ , where $\rho \in [0, 1]$ represents the mean density of particles per site, are invariant and translation invariant extremal for the SEP (which is studied in: [L] *Interacting Particle Systems*, by T.M. Liggett - 1985, Springer).

To go from this microscopic description to a macroscopic one, space is rescaled by N and time by a function $\theta(N)$ ($\theta(N) = N^2$ is the diffusive scaling, $\theta(N) = N$ the hyperbolic one): visualize particles moving on a lattice imbedded in the unit torus \mathbb{T}^d , with spacings of N^{-1} , that become dense as N tends to $+\infty$; and the generator is $\theta(N)\mathcal{A}$. This gives a family of processes denoted by P_N (resp. P_ρ) with initial distributions μ_N (resp. μ_ρ). The question is the macroscopic evolution of density. The stochastic process of empirical distributions

$$\nu_N(t) = \frac{1}{N^d} \sum_{x \in S} \eta_t(x) \delta_{x/N}, \quad 0 \leq t \leq T$$

($\delta_{x/N}$ is the Dirac measure on x/N) has values in the space $\mathcal{M}(\mathbb{T}^d)$ of nonnegative measures on \mathbb{T}^d , and induced distribution \hat{P}_N . To prove the convergence of \hat{P}_N to the Dirac measure concentrated on $\rho(t, r)dr$ where $\rho(\cdot, \cdot) \in [0, 1]$ is a weak solution of the *hydrodynamic equation*, the steps are (1) the family \hat{P}_N is tight, and (2) any limit point \hat{P} is supported on measure valued maps $\nu(t)$ weakly continuous in t with densities $\rho(t, r)$. For point 2, the following computation shows the problems to overcome, then the methods to proceed are introduced.

For a test function J on \mathbb{T}^d , write

$$\xi(t, J) - \xi(0, J) = \int_0^t \theta(N)\mathcal{A}(\xi(s, J))ds + M_N(t) \quad (1)$$

where

$$\xi(t, J) = \frac{1}{N^d} \sum_{x \in S} J\left(\frac{x}{N}\right) \eta_t(x).$$

The martingale $M_N(t)$ is negligible for large N . The difficulty is to replace $\theta(N)\mathcal{A}(\xi(s, J))$ by a function of $\xi(s, \cdot)$, to obtain a *closed equation* for the empirical measure, so that letting $N \rightarrow \infty$ in (1) will exhibit the hydrodynamic equation.

$$\begin{aligned} & \theta(N)\mathcal{A}(\xi(s, J)) \\ &= N \sum_{x, y \in S} \eta_s(x)(1 - \eta_s(y))p(y - x) \left[J\left(\frac{y}{N}\right) - J\left(\frac{x}{N}\right) \right] \quad (2) \end{aligned}$$

A Taylor expansion of J , and the properties of p enable summations by parts. Thus the r.h.s. of (2) is approximated in each of the following cases (we take here $d = 1$ to simplify notations) by:

(i) p is symmetric, i.e. $p(x) = p(-x)$, $\theta(N) = N^2$:

$$\frac{1}{2} \sum_{z \in S} z^2 p(z) \frac{1}{N} \sum_{x \in S} J''\left(\frac{x}{N}\right) \eta_s(x) \quad (3)$$

(i') the weakly asymmetric case, where the transition is $p_N(x) = p(x) + \frac{1}{N}q(x)$, with p symmetric and $q(-x) = -q(x)$, $\theta(N) = N^2$:

$$\begin{aligned} & \frac{1}{2} \sum_{x, y \in S} J'\left(\frac{x}{N}\right) \left(\frac{y-x}{N}\right) q(y-x) \\ & \times [\eta_s(x)(1 - \eta_s(y)) + \eta_s(y)(1 - \eta_s(x))] \quad (4) \end{aligned}$$

(ii) p has mean zero but is not symmetric, $\sum_{y \in S} yp(y) = 0$, $\theta(N) = N^2$:

$$\begin{aligned} & \frac{1}{N} \sum_{x, y \in S} \eta_s(x) \frac{1}{2} \left[J'\left(\frac{x}{N}\right) + J'\left(\frac{y}{N}\right) \right] \\ & \times N(1 - \eta_s(y))(y - x)p(y - x) \\ & = \frac{1}{2N} \sum_{x \in S} J'\left(\frac{x}{N}\right) NW(\tau_x \eta_s) \quad (5) \end{aligned}$$

τ_x being the translation by x on the lattice, and

$$W(\eta) = \eta(0) \sum_{z \in S} (1 - \eta(z))zp(z) - (1 - \eta(0)) \sum_{z \in S} \eta(z)zp(-z)$$

finally (iii) $\sum_{x, y \in S} yp(y) = m \neq 0$, $\theta(N) = N$:

$$\frac{1}{N} \sum_{x, y \in S} J'\left(\frac{x}{N}\right) \eta_s(x) N(1 - \eta_s(y))(y - x)p(y - x) \quad (6)$$

In (3), two integrations by parts were possible. This yields via limits in (1) a weak solution of the heat equation

$$\frac{\partial \rho(t, r)}{\partial t} = \frac{1}{2} \Delta \rho(t, r)$$

with initial condition $\rho(0, r) = \rho_0(r)$, where Δ is the Laplacian. Then, uniqueness of the weak solutions for a given initial density establishes the validity of the hydrodynamic limit.

A way to average the terms in (4) to derive $\rho(t, r)(1 - \rho(t, r))$ in the limiting equation is given in

Lecture 3. “Gradient models, Dirichlet forms and large deviations”. *The important ingredient in the analysis of gradient models is the ability to do averaging and replace quantities by their expected values calculated under various equilibrium distributions.* The main result of [KOV] is an averaging principle that we quote extensively.

Theorem 3.1. If μ_N is a sequence of probability distributions with density f_N w.r.t. the uniform distribution, whose Dirichlet form satisfies

$$\begin{aligned} \mathcal{D}_N(\mu_N) &= \frac{1}{2N^d} \sum_{\eta \in X} \sum_{x,y \in S, |x-y|=1} [\sqrt{f_N(\eta^{x,y})} - \sqrt{f_N(\eta)}]^2 \\ &\leq CN^{d-2} \end{aligned}$$

for a constant C independent of N , then for every local function g ,

$$\lim_{\varepsilon \rightarrow 0} \limsup_{N \rightarrow \infty} \delta_{N,\varepsilon N} = 0$$

with

$$\delta_{N,\ell} = E^{\mu_N} \left[\frac{1}{N^d} \sum_{x \in S} |(Av_\ell g)(\tau_x \eta) - E^{P_\rho} [g(Av_\ell(\eta(x)))]| \right];$$

$$(Av_\ell g)(\eta) = \frac{1}{(2\ell+1)^d} \sum_{z \in B_\ell} g(\tau_z \eta);$$

$$B_\ell = \{z \in S : |z_j| \leq \ell; 1 \leq j \leq d\}.$$

The proof of Theorem 3.1 is composed of the one-block estimate: $\lim_{\ell \rightarrow \infty} \limsup_{N \rightarrow \infty} \delta_{N,\ell} = 0$,

and the two-blocks estimate: *the local density does not fluctuate over small macroscopic length scales*, i.e.

$$\lim_{\varepsilon \rightarrow 0, \ell \rightarrow \infty} E^{\mu_N} \left[\frac{1}{N^d} \sum_{x \in S} |Av_\ell(\eta(x)) - Av_{N\varepsilon}(\eta(x))| \right].$$

Theorem 3.1 induces superexponential estimates, which imply as Application 1 hydrodynamics in case (i'), and as Application 2 large deviations for the symmetric SEP.

Lecture 4, “Relative entropy method”, is devoted to $d = 1, p(1) = 1, m = 1$, thus deals with (6), where an hyperbolic scaling leads to Burgers equation with zero viscosity

$$\frac{\partial \rho(t, r)}{\partial t} + \frac{\partial [\rho(t, r)(1 - \rho(t, r))]}{\partial r} = 0$$

This method needs both special random initial conditions and a smooth solution $\rho(t, r)$ of the equation in $[0, T] \times \mathbb{T}$, and it implies uniqueness of that smooth solution. Assume that for some $c > 0, c \leq \rho(t, r) \leq 1 - c$. For any $t \in [0, T]$, define a distribution $\alpha_N(t)$ by $\alpha_N(t) \{\eta(x) = 1\} = \rho(t, x/N)$; but the actual distribution of the particle system solves the Kolmogorov forward equation $\frac{d\mu_N(t)}{dt} = \mathcal{A}_N^* \mu_N(t)$, with $\mu_N(0) = \alpha_N(0)$. The latter equation combined with entropy inequality, one-block estimate and a careful reduction to Gronwall's lemma yield that the relative entropy satisfies

$$\lim_{N \rightarrow \infty} \sup_{0 \leq t \leq T} \frac{H(\mu_N(t); \alpha_N(t))}{N}$$

$$= \lim_{N \rightarrow \infty} \sup_{0 \leq t \leq T} \frac{1}{N} \sum_{\eta \in X} \log \left[\frac{\mu_N(t, \eta)}{\alpha_N(t, \eta)} \right] \mu_N(t, \eta) = 0.$$

With large deviations estimates, this implies the validity of the hydrodynamic scaling limit.

Lecture 5, “Nongradient systems”, is devoted to the asymmetric mean zero case with $d = 1$, so deals with (5). “Nongradient” means that, contrary to (3), we cannot write the current $W(\eta)$ as the gradient of a function, and, to derive the hydrodynamic equation

$$\frac{\partial \rho(t, r)}{\partial t} = \frac{1}{2} \frac{\partial}{\partial r} a(\rho(t, r)) \frac{\partial \rho(t, r)}{\partial r}$$

we need a theorem to the effect that there is a function $a(\rho)$ and local functions $g_\rho(\eta)$ such that it is almost true that $W = Ag_\rho + a(\rho)(\eta(0) - \eta(1))$ relative to P_ρ . This is Theorem 5.5. We do not say more about that case, conceptually and technically much more difficult than the preceding ones.

Lecture 6, “Nongradient case (continuation)”, contains the proof of Theorem 5.5.

To conclude, for an extensive study of the theory, we recommend the book: [KL] *Scaling Limits of Interacting Particle Systems*, by C. Kipnis, C. Landim (1999, Springer). It is self-contained (the necessary probabilistic and analytical tools are in the appendices), and each result or computation is detailed.

We also mention a text whose spirit is in between this mini-course and [KL]:

[JY] Jensen L., Yau H.T., *Hydrodynamical Scaling Limits of Simple Exclusion Models*. IAS/Park City Mathematics Series **6** (1999), 167–225.

Part II

On a 1-D Granular Media Immersed in a Fluid, by J. A. Carrillo.

A Class of Cellular Automata Equivalent to Deterministic Particle Systems, by H. Fukús.

Recent Results on the Ginzburg-Landau ϕ Interface Model, by T. Funaki.

Large Scale Behavior of a System of Interacting Diffusions, by I. Grigorescu.

Stellar Dynamics an Plasma Physics with Corrected Potentials: Vlasov, Manev, Boltzmann, Smoluchowski, by R. Illner. *Free Boundary Problem and Hydrodynamic Limit*, by J. Quastel.

A Variational Coupling for a Totally Asymmetric Exclusion Process with Long Jumps but No Passing, by T. Seppäläinen. *Quantum Mechanics, Linear Boltzmann Equation and Renormalization*, by H. T. Yau.

EDUCATION NOTES

Ed Barbeau and Harry White, Column Editors

Groupe des Responsables en mathématique

In this issue, I want to inform our readers about the *Groupe des Responsables en mathématique au Secondaire* (GRMS), a professional association for teachers at secondary level in Quebec. I discuss historical facts, objectives, activities and publications, and provide an address for those wanting to know more about this group.

Historique

L'origine de cette association remonte en 1971 où un comité de l'AMQ (*Association Mathématique du Québec*, re : *Notes* Avril 2001) fut mandaté pour s'occuper spécifiquement de la promotion de la mathématique au secondaire. Ce comité recommanda la création d'un groupe d'intérêt qui fut nommé GRMS et d'une revue appelée *Bulletin de Liaison* qui devint par la suite *Envol*. C'est le 31 octobre 1978 que le GRMS obtient ses lettres patentes. La première Session de perfectionnement du GRMS (qui tient lieu de congrès) s'est déroulée dans la région de Québec en 1974.

Objectifs et activités

Parmi les buts poursuivis par le GRMS, mentionnons entre autres:

- Informer, sensibiliser, consulter et représenter les membres sur divers sujets reliés à la mathématique au secondaire.
- Faire des recommandations à tout corps constitué, privé ou public, notamment au ministère de l'Éducation, pour tout ce qui a trait à la mathématique au secondaire.
- Organiser des rencontres professionnelles afin d'informer, de consulter et de perfectionner les membres.
- Produire et diffuser des documents relatifs à l'élaboration des programmes et à l'enseignement de la mathématique au secondaire.
- Inventorier les ressources et organismes reliés à la mathématique au secondaire.

Le GRMS organise à chaque année une session d'étude (mini-session) et une session de perfectionnement. Depuis 1998, il favorise et supporte la tenue de journées de formation continue. Plus de 700 personnes participent aux deux sessions, où on y présente plus de 125 ateliers de perfectionnement. Le GRMS collabore à la promotion du concours *Opti-math* et *Opti-math-plus*. La revue *ENVOL* est expédiée aux membres quatre fois l'an. De plus, le GRMS encourage l'innovation, la participation et l'excellence en honorant à chaque année des membres qui se sont distingués dans différents domaines de l'enseignement de la mathématique au secondaire : prix pour le meilleur scénario d'enseignement, prix pour le meilleur article publié dans la revue, prix à des finissants universitaires qui ont eu les meilleures performances durant leurs études de formation initiale.

Publications

En plus de sa revue *Envol*, le GRMS s'est porté garant de plusieurs productions qui viennent supporter le travail des enseignants dont un document sur la calculatrice à affichage graphique, un dossier spécial sur les coniques, un recueil de problèmes (Au jeu!) favorisant l'emploi d'heuristiques et l'utilisation d'outils électroniques, un ensemble d'activités servant à la préparation de concours mathématiques ou pour l'animation d'un club de mathématique, etc.

Divers

La 29e Session de perfectionnement du GRMS se tiendra au Cégep de Montmorency à Laval du 23 au 25 mai 2002. La thématique est: un porte-clés de compétences. Voir <http://grms.qc.ca>

Technology in the classroom

Recently, there has been a lively electronic discussion among the adherents of the Fields Institute Mathematics Education Forum about the use of technology, an important part of the new curriculum in Ontario. While the claim that technology is essential for teaching mathematics is extravagant (how many of us believe *that?*), there is no doubt that, properly handled, it is another very useful tool for imparting understanding. However, our discussion has made clear the abuses that might ensue if it is not properly handled or if it is regarded merely as a cheap alternative to the traditional mode. However, the experience of Fred Ferneyhough, a head of mathematics, is instructive. He has given me permission to share some of his thoughts with you on the use of the software *Geometer's Sketchpad* (GSP).

"I am an active proponent of the use of technology in the mathematics classroom. First, I have a department that has bought into this approach, maybe not as much as I would like, but fairly well. I am also blessed with a principal who supports my endeavours and I work for a publisher that has spurred my thinking on technology for the past four years.

"As with anything in teaching, I find that classroom management is a function of preparation, be it in a traditional lesson, a discovery lesson or in a technology lesson. When we first started teaching with this software and calculators, we found that it was necessary to provide step by step instructions, particularly for applied students. We have put together booklets of instructions that we keep in classroom so that kids can refer to these instructions while working on technology. In the case of GSP, we have a booklet with a large number of activities. Before the kids work on the machines, we do a demonstration of the software using either tv monitors or computer projectors. We also use the TI-92 calculator version of the software and most kids don't seem to mind using that approach. As kids finish an activity, they call us over to check

their work. I go around the lab and ask each student to show me what they have done and verbalize their work to me. It helps if I am active. I hope that no teacher in Ontario thinks that kids will ‘get it’ just because they are put in front of a computer and told to try things out. Far too many teachers think that all they have to do is show the kids where the software is on the menus. Even worse, far too many never even try it out.”

Ferneyhough is concerned that some of the correspondents in the Forum seem to “view most kids as either uninterested and/or bored and/or apathetic. I have been teaching since 1973 and was quite good at the old style of teaching. But, I have never enjoyed the mathematics classroom so much in my career as I have in the past three years. I believe that this is a function of my own approach to teaching in that I want this to work and have actively prepared each course using the new approach. It is definitely not due to my having superior students. I teach at Central Peel SS in Brampton. It is located in a community that is much poorer than average with a population that is very transient. Our turnover rate in the student body approaches 40% some years. Ours are kids who have rarely found success or joy in learning, particularly in mathematics and science. Even a cursory viewing of my school and students will show that there are reasons why our kids did so poorly on average on the EQAO (the Education Quality and Accountability Office) tests last year. What is important is that we have had an impact on kids attitudes and have seen improvement each year. Our first group of kids bought into the program quickly and their mastery of the use of technology is almost incredible. I would say that many of the kids that are currently in grade eleven U[niversity], U[niversity]/C[ollege] and personal finance courses are more adept at using sketchpad and the TI-83 calculators than the majority of teachers in Ontario. They now look for ways in which to use these products and look forward to the use of technology.

“I believe in building skills after I have installed an interest in learning. The *Geometer’s Sketchpad* is one of the best products that I have found to do this. I can accomplish far more with the software than I could with the traditional mathematical instruments and kids are far more engaged in learning because of the dynamic nature of this software. It upsets me that my daughter, currently in grade seven, is doing constructions in geometry with only compasses and protractors. It upsets me that I had to call my older daughter’s school when she was in grade nine to ask why GSP had not been used there. Yes, there will be problems in a lab, but I can manage that. Yes, there are kids that will not buy into the program, but there are far more who will. Yes, there are expectations in the curriculum that some kids will never see a use for, but I bet that they will still have fun with the software. Yes, there is a learning curve for both teachers and students, but I welcome that. However, I would suggest that we go back to the

same comments that I heard Mary Lou Kestell make about five years ago and what turned my attitudes around. The universities had been complaining for years that what we were doing was not working. Five years of strictly algebraic drill and kill did not produce a student that was necessarily successful in university. Most kids came to the university with dreadful preparation and could not succeed. What was missing was that kids were not learning how to learn nor was there is an intrinsic joy in learning. What they could do very well is perform to our expectations in lower thinking skills and types of problems that passed for problem solving. Only a very small percentage of kids will learn as well as people like myself did and in the manner in which I taught for so long.

“*Sketchpad*, the 83, the 92, *Fathom*, *ZapAGraph*, and other such products are tools that help me help my students achieve at a higher level than I ever could before. I’m very thankful that the Expert Panel that Mary Lou and Marg Warren helped steer took us in the direction that they did. The new curriculum is not perfect and will need fine tuning. We made a lot of errors in grade nine and I made more than my share. But I would never go back to just chalk and talk.”

The social context of education

Moses is expressing a deep truth that frequently goes unrecognized in discussions of math education: social aspects are often more important than anything else. The best lesson plans and the best textbooks in the world will not do much good if students do not respect their teachers, if their peer group is constantly telling them that studying math is “un-cool”, if teachers are burnt out and demoralized, if parents and local community leaders are uninvolved in the schools, and if national political leaders approach educational issues irresponsibly and demagogically.

–Neal Koblitz in his review of *Radical equations*, by Robert P. Moses and Charles E. Cobb, Jr. in *Notices of the AMS* 49:3 (March, 2002), 328-332

Recently, three interesting articles came to my attention. The first was the review from which the foregoing quotation was taken, the second an article in the *National Post Business* magazine for March, 2002 and the third an article in the *Toronto Star* by a student who failed to follow his muse when going to university. All three of them, each in its own way, draw attention to the structural and societal factors that must be taken into account in any discussion of educational reform.

I went to school in the 1940s and 1950s, at a time when a pupil quitting school at age 14 had a reasonable chance to get a decent job, and when a grade 12 certificate provided the entry to many positions in the white collar world. Grade 13 was intended for those continuing to university, although the enrolment was beginning to increase substantially. In Ontario at any rate, students going into secondary education were streamed into vocational or commercial schools, or collegiate institutes. There were a number of professions, such as op-

tometry, that could be entered after high school graduation and a few months of specialized training. Whatever the flaws with this system, and they were numerous and significant, it operated under a pretty good social consensus about what schools were intended for and a great deal of stability with respect to practice and the syllabus.

For some people, the system of this era was pretty brutal. Many students fell by the wayside. Partly for this reason and partly in response to the perception that a modern society would require more highly educated population, the education system became considerably more accessible during the 60s and sought to soften, if not remove, the stigma of failure from those who encountered academic difficulty. A cycle of consequences ensued, resulting in the situation that for the purposes of getting a job, high school graduation is the analogue of a grade VIII certificate sixty years ago and a university degree the analogue of matriculation from high school. Leaving school at age 14 is tantamount to committing economic suicide. From the point of view of acquiring useful skills, it is not clear that the increased amount of education has lived up to its promise, and it appears that in some cases, a demand for more education by employers may serve merely as a screen to increase the probability of finding more suitable applicants. In any case, the population of a typical high school became considerably more diverse, and a lot of energy of teachers, administrators and politicians was devoted to addressing this fact.

Their work has been greatly complicated by a number of social factors, and it is worth drawing attention to some of these. The old consensus about schools has lost and education has become quite politicized. In the process, the professionalism of teachers has been attacked. This has been seen not only in the attempts of governments to manage and impose policy from above, but in a number of smaller ways. In his review, Neal Koblitz draws attention to something that I too have noticed when I have had occasion to speak in schools, the succession of peremptory interruptions teachers and students have to face that indicates "little respect for the integrity of the class hour". Since their schooling has become such a high stakes enterprise for pupils, the pressures upon them from their parents, their peers, themselves, and society at large have become enormous. Rather than becoming an arena in which they have the opportunity to test their interests and explore their potentialities, schooling has become tied to their future economic viability and so, for many, schools have become sterile, oppressive and narrowing places.

The Toronto Star article describes a particular example of this. Michael Kanert performed well in high school. Although he loved English, art and drama, he persuaded himself that it would be best to choose a tertiary program that would open as many doors as possible. So he went into engineering; after all, he "couldn't justify paying tens of thousands of dollars for a degree that wouldn't provide any return on my

investment". It turned out that he did not have the heart for his science studies and his grades plummeted. In second year, he realized it was useless and tried to transfer into English. When his parents withdrew their support, he persevered to get a degree, losing his scholarship in the process. He is finally trying to establish himself in the career he wanted all along. As he put it, "every play I see makes me want to leap onstage, every book I read drives me to write and create."

I wonder how often this story is multiplied, both in high school and university, how many students are leading lives of quiet and not-so-quiet desperation, going through the motions of getting that certificate or degree, and putting their lives on hold. It is not that the ideal of universal education is a bad one or that the university is only for a small elite. I do not believe either of these for a moment. But we do seem to have a lot of students in the wrong place at the wrong time, and over the past thirty years this has led to a continual tinkering with the curriculum and evaluation, precipitous action and turmoil, without much to show for it. It is time to think more radically.

A particular brand of radical thinking in the city of Edmonton is the burden of the article in the *National Post Business Magazine* by Andrew Nikiforuk. It seems that from 1995 until the present, Edmonton had a superintendent of education, Emery Dossdall (now headed for British Columbia to become deputy minister of education) who shook up the system by focussing on student achievement, vesting more authority and accountability in the principals and inviting within the public system the formation of schools with special mandates. This seems to have turned around the drain of pupils to the private system, although it is not clear that the achievement of students is superior to those in a more traditional system, such as that of Calgary.

The Edmonton scheme is one way to respond to the diversity of the modern student body and the needs of the marketplace. But is it a route that we should follow? Part of our answer turns on what is meant by "student achievement"; it is not clear that the focus may lead to education in the deeper sense. The model may also threaten the notion of the schools as a community in which students collaborate together in a number of enterprises, only some of which are academic. Part of the growth of a student follows from participation in extra-curricular activities and in school governance, which may offer experiences hard to replicate later in life but which may lay the groundwork for a network of interests and contacts that will ultimately enrich life. The academic program should encourage students to develop broad skills in communication and analysis, and to get above the detail to find a worldview of knowledge that can inform their interests and maturation. They should gain the confidence, persistence and preparation for delving more thoroughly into the areas of concentration they need or desire.

Such an approach to education requires of secondary students autonomy to set and prosecute their own goals while

making effective use of the resources of the school. Thus, the fostering of this attribute becomes an important goal of elementary education. In the case of mathematics, this means the development of a curriculum that is heavy on investigations and the solutions of problems that require some strategizing and analysis and that force engagement with central concepts. This curriculum will also focus on effective communication, sound use of mathematical terminology and notation. The classroom regime would be flexible enough to challenge students to the level of their abilities without overwhelming any of them. There is a lot of mathematics that combines both immediate appeal and accessibility with an optional depth of challenge. A neglected area in curricular development is the enormous number of fine expository books written for the nonmathematical reader. Such a list would run to many pages, and we could do much worse than having students read an anthology that contains works from Lewis Carroll to Martin Gardner and Sherman Stein. The history of mathematics is another vehicle for conveying fundamental mathematical ideas.

Those students who want to go on in mathematics will need to acquire the appropriate technical fluency, a task that may be made easier if they have learned in their courses to be aware of structure and the need to make judgments towards particular goals. Ideally, the necessary but more tedious acquiring of mathematical skill is something that students could practice on their own. Just as intending music students would augment their school work with lessons and external examinations, the intending mathematics student would be encouraged to test their mastery in fairs, contests and external examinations. Students coming to university to study science and engineering would require not only a high school diploma, but a portfolio with some evidence that they will have the background to meet the demands of their tertiary programs.

This is certainly a tall order. But a recognition that the current educational scene is materially different from that of previous generations indicates a radical approach, but one that is not hastily conceived and executed. It has implications for pre-service and in-service formation of teachers and for challenging the values that are brought to education by students, parents and officials alike. The effecting of such a program would be the work of a generation. However, there are individual schools that are already working in this direction. In one of my undergraduate courses, I had a remarkable student who told me that a substantial reworking of the program occurred in her high school over a decade ago. It did away with classes in the traditional sense. Students now make a learning contract with the school, and have a different relation with teachers who serve chiefly as guides and advisers and orga-

nize classes on an ad hoc basis. She evinced a strong sense of independence and critical judgment, in which a rigorous approach to mathematics was not lacking.

For thirty years, governments have been tinkering with the system, making adjustments here and there, or, in spite of revolutionary fervour, trying to turn the system upside down on the basis of current fashions of thinking, half-baked goals and oblivion to the broader goals that one might espouse for education. Even ideas that might have succeeded have been undermined by hasty application or quick abandonment before they had time to grow and develop. One casualty of this approach is that some of the newer areas of mathematics, particularly in graph theory and optimization, that could have found a place in the secondary curriculum have received no consideration at all. Had there been more wisdom during the turmoil of the sixties and the seventies, then we might have been able to achieve by now an education system that was tuned to the realities (not just the commercial ones) of modern society and included a mathematics program in which students caught a vision of one of the greatest achievements of the human intellect.

Canadians Shine in Putnam Contest

Canadian students have placed highly in the sixty-second annual **Putnam Mathematical Competition**, written on December 1, 2001. Two teams ranked between sixth and tenth, inclusive, to receive a team honourable mention: **University of Toronto** and **University of Waterloo**. The members of the University of Toronto team were **Jimmy C. Chui**, **David Varodayan** and **Pompiliu-Manuel Zamfir**. The University of Waterloo team were **Byung Kyu Chun**, **David Nicholson** and **Shu Niu**.

The highest ranking student in Canada (placing in the 16th to 26th range) was **Jimmy C. Chui** of the University of Toronto. **Jonathan R. Sparling** of the University of Toronto, ranking in the 27th to 61st range, received honorable mention. Several other students came within the top 100: **Jesse C. McKeown** of McGill University, **Pompiliou M. Zamfir** of the University of Toronto, and **Byung K. Chun**, **Vaughn A. Climenbaga**, **Shu Niu** and **Carl-Johan T. Ragnarsson** of the University of Waterloo. In all, 26 students from 11 Canadian universities placed among the top 200. The Society would like to congratulate these students on their fine performances.

A total of 2954 students from 453 colleges and universities in Canada and the United States participated in the competition. The top team was that of Harvard University and the second, that of the Massachusetts Institute of Technology. Canadian student and former Canadian IMO team member, David Arthur, helped the team of Duke University attain the third position.

FROM THE INSTITUTES

PIMS Schedule



<http://www.pims.math.ca/>
pims@pims.math.ca

PIMS Thematic Programme on Asymptotic Geometric Analysis

www.pims.math.ca/aga

Conference on Convexity and Asymptotic Theory of Normed Spaces, July 1-5, PIMS-UBC

Concentration Period on Measure Transportation and Geometric Inequalities, July 8-12, PIMS-UBC

Conference on Phenomena of Large Dimensions, July 14-23, PIMS-UBC

Focused Research Groups on Random Methods and High Dimensional Systems, July 24-August 5, PIMS-UBC

Conference on Non-Commutative Phenomena and Random Matrices, August 6-9, PIMS-UBC

Conference on Banach Spaces, August 12-15, PIMS-UBC

PIMS Thematic Programme on Selected Topics in Mathematical and Industrial Statistics

www.pims.math.ca/stats

Workshop on the Role of Statistical Modeling in the 21st Century, May 4-6, SFU

3rd MITACS AGM: Statistics for Large Scale Industrial Modeling, May 23-25, UBC

International Conference on Robust Statistics, May 12-18, PIMS-UBC

Workshop on Design and Analysis of Experiments, July 14-18, Coast Plaza Suites Hotel, Vancouver

Workshop on Filtering Theory and Applications, July 25-30, Edmonton and Jasper

PIMS Scientific Activities

1st PIMS School of Mathematical Biology for Senior Undergraduates, May 11-19, University of Alberta

3rd Pacific Northwest PDE Conference, May 15-18, Washington State University

MSRI Summer Graduate School, June 17-28, PIMS-SFU

2nd Canadian Conference on Nonlinear Solid Mechanics, June 19-23, SFU

Canadian Undergraduate Mathematics Conference, July 2-7, University of Calgary

5th Americas Conference on Differential Equations and Nonlinear Dynamics, July 7-12, University of Alberta

PIMS-APCTP-PI Frontiers in Mathematical Physics: Brane Worlds and Supersymmetry, July 22-August 2, UBC
 Symposium on Aperiodic Order, Dynamical Systems, Operator Algebras and Topology, August 4-8, U. Victoria
 Numerical Analysis Potlatch 2002, September 5, U. Victoria
 Cascade Topology Conference, November 2-3, UBC
 PIMS PDF Meeting, November 30-December 1

PIMS Industrial Activities

5th PIMS Graduate Industrial Mathematics Modelling Camp, May 18-23, SFU

6th PIMS Industrial Problem Solving Workshop, May 27-31, UBC

PIMS-MITACS Summer School on Applications of Computational Geometry, June 10-14, SFU

PIMS-MITACS Workshop on Facility Location Problems, June 16-18, SFU

4th PIMS School of Environmental and Industrial Fluid Dynamics, July 28-August 9, University of Alberta

PIMS Co-sponsored Computer Science Events

International Database Engineering and Applications Symposium, July 17-19, Edmonton

2nd Canadian Database Research Workshop, U. Alberta

8th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, July 23-26, Edmonton

3rd International Conference on Computers and Games, July 25-27, University of Alberta

AAAI Conferences, July 28-August 1, Edmonton

18th Conference on Uncertainty in AI, August 1-4, U. Alberta

Symposium on Abstraction, Reformulation and Approximation, August 2-4, Kananaskis Mountain Lodge, AB

10th International Conference on Intelligent Systems for Molecular Biology, August 3-7, Edmonton

IEEE Foundations of Computer Science Conference, November 16-19, Delta Pinnacle Hotel, Vancouver

International Symposium on Symbolic and Algebraic Computation, November 20-23, Vancouver

Deadlines for PIMS Opportunities

October 15: Applications to the National Programme Committee

October 15: Applications to the Fall Competition of the PIMS Scientific Review Panel

October 15: Nominations for PIMS Prizes

October 15: Submissions for BIRS 2004 programme

PIMS Education Activities

Alberta High School Mathematics Competition, Part I of the 2002-2003 Season, November 19

PIMS Elementary Grades Math Contest, May 25, UBC

Summer Math Camp for Grades 8-10, August 14-21, U. Alberta

Dedication of Sculpture in Honour of H.S.M. Coxeter's 95th Birthday

Professor Emeritus H.S.M. Coxeter of the University of Toronto celebrated his 95th birthday at the Fields Institute with the dedication on Friday, February 15 of this year of a geometric sculpture in his honour. It was a grand event with speeches to an overflow audience by Fields Director Ken Davidson, Professor John Conway of Princeton, and the sculptor Marc Pelletier. The sculpture, the gift of a generous and anonymous donor, is an orthogonal projection of a regular 4-dimensional polytope, the 120-cell, into 3-space. It is suspended from the ceiling of the Institute atrium.



(from l to r) Marc Pelletier, H.S.M. Coxeter and John Conway

Ken Davidson began by expressing his appreciation to the guest of honour for his determination in attending the ceremony in spite of being hospitalized at the time. Ken then related the story of the scaffolding that had been built in the atrium to hang the sculpture. He concluded his remarks by saying that in spite of his health problems, Donald was still proving theorems!

Donald Coxeter then talked briefly of his health, thanked those present for attending, and spoke of his pleasure at having been present at the time that the sculpture was hoisted into place. The geometric figure represented by the sculpture was discovered in the 1850s by Schläfli and subsequently by several other people among them Alicia Boole Stott, a daughter of George Boole. Donald reminisced about how he met 'Aunt Alice', as she was called. A wire model of a projection of the 120-cell was first constructed and exhibited by Paul Donchian in 1934, but since it was a non-orthogonal projection, it had twice as many vertices as the Pelletier model (which is doubly covered).

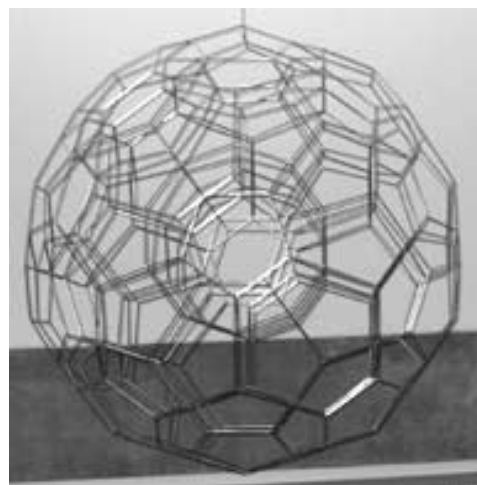
In his introduction of John Conway, the Director mentioned that the Institute had been the fortunate recipient of another piece of sculpture on Donald's 90th birthday, the Bormean rings which grace the entrance way to the building.

Conway began by thanking Donald for being an inspiration to him over many years. As a high-school student, he had

first corresponded with Donald after discovering that by labeling the vertices of a hypercube in a natural way one can derive a number of magic squares. But Coxeter's influence had not on all occasions been a salutary one while solving a problem posed by Donald while crossing the street, the speaker had been hit by a garbage truck.

The mathematical part of his lecture consisted of an explanation of his method of better understanding polyhedra and polytopes by interrelating them. He also talked about an extension of the Schläfli symbol, originally due to Dress, to arbitrary polytopes. In closing, Conway told of his love of polyhedra, his gratitude to Marc for his artistry and to the anonymous donor for his gift and most of all to Donald Coxeter for his inspiration.

Marc Pelletier then spoke about Paul Donchian. Marc, a long time admirer of Donald, expressed his gratitude for being given the entire file of correspondence Donald had with Donchian. He used the overhead projector to show the audience amusing newspaper clips about the exhibition of 1934 and some of Donchian's drawings of regular polytopes and polyhedra.



The 120-cell, of which the sculpture is a 3-dimensional orthogonal projection, can be described as the regular convex polytope whose 120 3-dimensional faces are congruent dodecahedra, with 3 around each edge, just as the dodecahedron itself can be described as the regular convex polytope whose 12 faces are congruent regular pentagons with 3 meeting at each vertex. The sculpture itself is a fascinating entanglement of pentagons, hexagons and dodecahedra. A more detailed description will appear in the June newsletter of the Institute.

based on an article to appear in the June issue of the Fields Institute Newsletter

AWARDS / PRIX

Darmon Wins Steacie Fellowship



Henri Darmon

What do theoretical mathematician Henri Darmon and online shoppers have in common?

They both appreciate the benefits of a special kind of algebraic equation called an elliptic curve. For the point-click-and-pay crowd, these equations are the basis for secure online credit card transactions. For Dr. Darmon, they are a portal into a realm of mathematical discovery.

The McGill University mathematician's work on elliptic curves has gained him recognition as one of the world's leading young number theorists.

For this work Darmon is being awarded a 2002 Natural Sciences and Engineering Research Council (NSERC) Steacie Fellowship, one of Canada's premier science and engineering prizes.

The award is one of six announced recently by Maurizio Bevilacqua, the Secretary of State for Science, Research and Development, on behalf of Allan Rock, Minister of Industry and Minister responsible for NSERC, and by Dr. Tom Brzustowski, President of NSERC.

"These winners will help Canada become one of the top five countries in the world for research and development attracting and retaining the best and brightest minds," said Minister Rock. "This is an important part of making Canada more innovative and competitive in the global economy."

"NSERC Steacie Fellowships are awarded to Canada's most outstanding researchers," said Secretary of State Bevilacqua. "The winners continue to make a mark for themselves and for Canada on the international research scene. The NSERC Steacie will give them the opportunity and resources to develop their ideas to a new level of excellence."

Adams Prize Winner 2002 announced

The Adams Prize is awarded each year by the Faculty of Mathematics and St John's College, University of Cambridge, to a young, UK-based researcher doing first class international research in the Mathematical Sciences.

This year's topic is Number Theory, and the winner is Dr. Susan Howson, who currently holds a Royal Society Dorothy Hodgkin Research Fellowship in conjunction with a lectureship at the University of Nottingham.

Dr. Howson has previously held a Moore Instructorship at the Massachusetts Institute of Technology, and a European Union Training and Mobility of Researchers post-doctoral position at the University of Paris 13. Her interest in mathematics was sparked by her middle school teacher, David Womersley. She has no mathematical background: her father is an electrician, her mother a secretary. "I was just encouraged at school all the way through to University." But she believes some women are deterred from working in pure mathematics not only by the lack of role models, but also by its highly competitive nature.

Dr. Howson has done research of great promise on the study of the arithmetic of elliptic curves via the p-adic methods of Iwasawa theory. Her work involves novel techniques from non-commutative algebra, combined with number-theoretic arguments.

Professor John Coates, Chairman of the Adams Prize Adjudicators, said: "The arithmetic of elliptic curves is one of the oldest parts of mathematics, and the beauty and mystery of its unsolved problems have kept it at the forefront of international research today. It is also an area which has important applications to cryptography. "British mathematicians have made some of the greatest contributions to the arithmetic of elliptic curves, starting with L. J. Mordell's proof of his celebrated finite basis theorem in 1922.

"Much of current international research in the field has been inspired by the p-adic methods first introduced by the great Japanese mathematician K. Iwasawa to study the arithmetic of cyclotomic fields. Although only 29, Dr. Howson has played a major role in developing highly promising new methods from non-commutative algebra and the theory of p-adic Lie groups to be used in the Iwasawa theory of elliptic curves."

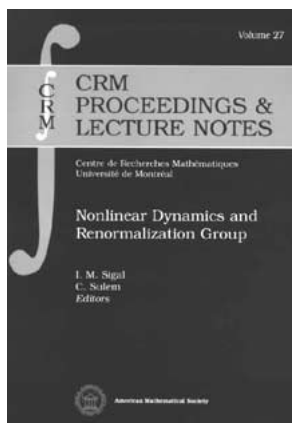
The Adams Prize is named after the mathematician John Couch Adams and was endowed by members of St John's College. Currently worth £12,000. It commemorates Adams' discovery of the planet Neptune, through calculation of the discrepancies in the orbit of Uranus. Previous winners have included the physicist James Clerk Maxwell and the geometer Sir William Hodge.

Nonlinear Dynamics and Renormalization Group

Book Review by Richard Froese, University of British Columbia

Nonlinear Dynamics and Renormalization Group

edited by I.M. Sigal and C. Sulem
CRM Proceedings 27
AMS, 2001
192 pp



This proceedings volume contains lectures delivered at a workshop entitled *Nonlinear Dynamics and Renormalization Group* and held at the CRM in the summer of 1999. The workshop organizers, Michael Sigal and Catherine Sulem, invited a diverse and interesting group of speakers. The result

is an entertaining volume that will interest mathematicians with a bent for mathematical physics.

There are five lectures that could be roughly classified as mathematical quantum theory. *Costin, Lebowitz and Rokhlenko* consider time periodic perturbations of a one dimensional quantum system. They prove complete ionization for large time, that is, that the projection onto the ground state of the time evolved state tends to zero. *Graf* studies the ground state of supersymmetric matrix models. *Merkli's* paper is about the time evolution of resonances. *Soffer* discusses dissipation of energy from small system to a large infinite dimensional one. *Vasilijevic* introduces the resonance free energy for a class of Schrödinger operators admitting complex deformations, and studies the limit of this function as the temperature tends to zero.

Four lectures deal with non-linear evolution equations. *Lin* discusses the semi-classical limit of a modified non-linear Schrödinger equation. Blowup phenomena for solutions of the non-linear Schrödinger equation are studied in the papers by *Nawa* and *Perelman*.

Pelinovsky and Sulem's paper is about embedded solitons in solutions to the Davey–Stewartson II equation.

Three lectures deal with the Ginzburg-Landau equations. *Alama and Bronsard* study a stratified version of the Ginzburg-Landau equations, aimed at a phenomenological description of high temperature superconductors. The papers by *Gustafson* and *Serfaty* describe some results on vortices and their stability. The remaining lectures cover a variety of related topics. *Alikakos and Fusco* discuss a free boundary problem arising in the study of a two phase system in three dimensions. The topic of *Auckly and Kapitanski's* paper is the control of underactuated systems. These are systems, like a bicycle, where there are fewer control inputs than degrees of freedom. *Dimock* discusses the renormalization of the sine-Gordon model in Euclidean quantum field theory. *Bogoyavlenskij* solves the problem of finding global axially and helically symmetric solutions the plasma equilibrium equations. Finally, *Kiessling's* paper is on new developments in classical electron theory.

Mathematics with a Human Face

by J. Harley Weston (University of Regina)

During the World Mathematical Year in 2000, the Canadian Mathematical Society produced a poster on the theme Women in Mathematics. This poster featured the Krieger-Nelson prize winners and was sent to most schools across the country. The poster was enthusiastically received by teachers and students, and the CMS has received numerous requests to expand this idea and produce additional posters. With support from the CMS, we are beginning work on the next poster together with virtual support on Math Central <http://MathCentral.uregina.ca>.

We've titled our project "Mathematics with a Human Face", and again intend to attract the interest of students and teachers by featuring specific mathematicians. The theme of the second poster will be careers in mathematics. We want

to illustrate a variety of mathematical careers by featuring individuals with degrees in mathematics and highlighting their work.

We are looking for mathematicians throughout the country to be part of the careers web page from which we will select individuals for the poster. These may be individuals with a bachelor's degree in mathematics working in industry or research-oriented mathematicians in academic positions. The intention is to feature a demographically and geographically dispersed group of individuals with a wide variety of careers, individuals who are well-established in their fields, as well as young people enthusiastic about their futures. We need your help in identifying these people. Please send us names and contact information of past students and others you know

of who fit our criteria or, if you prefer, have them contact us directly. We can be reached at CMPoster@math.uregina.ca or through the link to Mathematics with a Human Face at Math Central.

Au cours de l'année internationale des mathématiques en 2000, la Société mathématique du Canada (SMC) a produit une affiche sur les femmes en mathématiques qui mettait en évidence les lauréates du prix Krieger-Nelson et avait été envoyée à la plupart des écoles du pays. L'affiche a connu un grand succès auprès des enseignants comme des élèves, et la SMC a reçu de nombreuses demandes de personnes qui souhaitaient voir la publication d'autres affiches. Avec l'appui de la SMC et le soutien « virtuel » de la Centrale des maths <http://mathcentral.uregina.ca/findex.html>, nous avons donc entrepris la conception d'une nouvelle affiche.

Notre projet s'intitule « Le visage humain des mathématiques ». À nouveau, nous souhaitons susciter l'intérêt des élèves et des enseignants en faisant connaître des mathématiciens. La seconde affiche aura pour thème les carrières en

mathématiques. Nous souhaitons illustrer diverses professions mathématiques en présentant des diplômés en mathématiques et en faisant ressortir leur travail.

Nous sommes à la recherche de mathématiciens du pays qui accepteraient de paraître sur notre page Web des carrières, d'où nous choisirons ceux et celles qui figureront sur l'affiche. Ces gens peuvent être des diplômés en mathématiques travaillant dans l'industrie, ou les mathématiciens orientés dans la recherche mathématiques. Notre objectif : présenter un groupe diversifié tant du point de vue démographique que géographique, formé de personnes de professions diverses, tant des personnes reconnues dans leur domaine que des jeunes professionnels enthousiastes et ayant confiance en l'avenir. Nous avons besoin de votre aide pour recruter ces personnes. Envoyez-vous les noms et les coordonnées d'anciens étudiants ou d'autres personnes dont le profil correspondrait à nos critères ou, si vous préférez, demandez-leur de communiquer directement avec nous. Pour nous contacter, écrivez à CMPoster@math.uregina.ca ou cliquez sur le lien Le visage humain des mathématiques de la page Centrale des maths.

Réunion d'hiver 2002 de la SMC du 8 au 10 décembre

Hotel Marriott Ottawa Ottawa (Ontario)

Voici le programme provisoire de la Réunion d'hiver 2002 de la Société mathématique du Canada. La première annonce paraîtra dans le numéro de septembre 2002 des *Notes de la SMC* et sur notre site Web: <http://www.cms.math.ca/Events/winter02/indexf.html>.

HÔTE : Département de mathématiques et statistiques, Université d'Ottawa.

CONFÉRENCE PUBLIQUE : **Robert Zuccherato** (Entrust).

CONFÉRENCIERS PRINCIPAUX : **James Arthur** (Université de Toronto), **Rene Carmona** (Université Princeton), **Victor Guillemin** (MIT), **Maciev Zworski** (Université Berkeley).

PRIX : **Conférence Coxeter-James**: **Lisa Jeffrey** (Université de Toronto), le **Prix de doctorat** et le **Prix Adrien-Pouliot**.

SYMPOSIUMS : **Mathématiques financières**, Org: Luis Seco (Toronto); **Éléments finis**, Org: Roger Pierre (Laval); **Histoire des mathématiques**, Org: Richard O'Lander (St. Johns N.Y.) et Ronald Sklar (St. Johns N.Y.), **Algèbres de Lie et Moonshine**, Org: Abdellah Sebbar (Ottawa) et Erhard Neher (Ottawa), **Enseignement des mathématiques**, Org: Thomas Steinke (OCCDSB); **Théorie des nombres**, Org: Damien Roy (Ottawa) et Kenneth Williams (Carleton); **Algèbres des opérateurs**, Org: Thierry Giordano (Ottawa) et David Handelman (Ottawa); **Équations aux dérivées partielles**, Org: Victor Ivrii (Toronto) et John Toth (Toronto); **Problèmes mathématiques provenant du monde industriel**, Org: André Dabrowski (Ottawa); **Théorie des représentations des groupes Réels et p-adiques**, Org: Jason Levy (Ottawa) et Monica Nevins (Ottawa); **Géométrie symplectique**, Org: Lisa Jeffrey (Toronto) et Eckard Meinrenken (Toronto); **Théorie et applications des processus ponctuels**, Org: Gail Ivanoff (Ottawa) et David McDonald (Ottawa); **Communications libres**, Org: à confirmer.

DIRECTEUR DE RÉUNION : Daniel Daigle (Ottawa).

LOGISTIQUE LOCALE : Walter D. Burgess (Ottawa) et André Dabrowski (Ottawa).

(PRESIDENT—continued from page 1)

Geoffrey Grimmett (Cambridge), Barry Simon (Caltech) and an excellent Public Lecture delivered by De Witt Sumners of Florida State University entitled “Calculating the secrets of life: Mathematics in Biology and Medicine”. The ten well attended Symposia were as follows:

Abstract Harmonic Analysis (Org: Anthony Lau, University of Alberta and Keith Taylor, University of Saskatchewan); *Geometric Topology* (Org: Alex Chigogidze and Ed Tymchatyn, University of Saskatchewan); *Graph Theory* (Org: Brian Alspach and Denis Hanson, University of Regina); *Infinite dimensional Lie theory and representation theory* (Org: Stephen Berman, University of Saskatchewan); *Mathematical Education Cognition in Mathematics* (Org: Florence Glanfield, University of Saskatchewan); *Matrix Analysis* (Org: Judi MacDonald, University of Regina); *Model theoretic algebra* (Org: Bradd Hart, McMaster University/Fields Institute, F.-V. Kuhlmann and S. Kuhlmann, University of Saskatchewan); *Number Theory - in honour of David Boyd* (Org: Peter Borwein, Simon Fraser University and Michael Bennett, Illinois); *Rigorous studies in the statistical mechanics of lattice models* (Org: Chris Soteros, University of Saskatchewan and Stu Whittington, University of Toronto); *Scattering theory and integrable systems* (Org: Jacek Szmigielski, University of Saskatchewan).

All scientific talks were held at the University of Saskatchewan. Some pre-meeting activities, the opening reception and the meeting banquet took place at the Delta Bessborough Hotel. The Delegates’ Luncheon on Saturday, June 2 and the lunch on Sunday and Monday were included in the registration fee a special feature which many participants commented favourably on.

The Meeting Director, Keith Taylor, the Chair of Local Arrangements, Christine Soteros, the session organizers, together with helpers from the local department and the CMS Executive Office, deserve our especial thanks. The attendance of 285 was excellent and the consensus was that the conference was first rate.

The Canadian Mathematical Society’s 2001 Winter Meeting was held at the Toronto Colony Hotel from December 8 to 10, 2001, and was hosted by York University. As evidenced in both summer and winter meetings, our meetings rely on a great deal of local effort for which I express the Society’s gratitude. The Meeting Director, Tom Salisbury, the Chair of Local Arrangements, Juris Steprans, together with Stanley Kochman and the many helpers from the local department, deserve our especial thanks. So too does Monique Bouchard and the entire staff of the CMS Executive Office.

This meeting celebrated the varied accomplishments of five of our colleagues. The CMS **Coxeter-James Lecture** was given by Kai Behrend, University of British Columbia, the CMS **Doctoral Prize Lecture**, was given by Nathan Ng, formerly from UBC and now at the University of Georgia.

The CMS **Adrien Pouliot Prize** for educational contributions was awarded to George Bluman, University of British Columbia while the CMS **Distinguished Service Award** was presented to James Timourian, University of Alberta. I described further details regarding the 2001 Winter Meeting in the February 2002 Notes.

National Educational Forum

The CMS Board has endorsed holding a national educational forum in Montreal from May 16-18, 2003 with a follow up meeting to be held roughly nine months later in Ontario.

These Fora will bring together roughly 200 people from all provinces and territories representing the different groups with interest in and impact upon mathematical education in middle and high school (roughly grades 6-12). The co-organizers are Christiane Rousseau (Montréal) and George Bluman (UBC), who are building the scientific programme. The Chair of the Local Organizing Committee is Louis Charbonneau (UQAM).

Joint Meetings

At the initiation of Michel Waldschmidt, President of the Société mathématique de France, the CMS is involved in a multi-society (pure and applied) meeting in Toulouse in July of 2004. This promises to be an exciting opportunity for a primarily francophone mathematics meeting.

It is a reflection of the growing interaction of CMS and CAIMS, that 2004 will also see the second joint CMS-CAIMS Meeting in the Summer in Halifax.

Other Recent Activities

Let me highlight some of the Societies recent activities, for the most part avoiding things described in other Annual Reports - some of which were published in the April 2002 Notes. Indeed some of the activities previously included in the annual presidential reports are now better described in the report of the Advancement of Mathematics Committee, also chaired by the President.

International Congress of Mathematicians: Preparation for next IMU Congress in Beijing in August 20-27, 2002 is well underway and I have been able to arrange a Canadian reception during the Congress, hosted at the reportedly spectacular Canadian Embassy by the Canadian Ambassador. This will be jointly sponsored by the CMS and the three national Research Institutes.

More substantively, I sit, as deputy chair, on the IMU’s *Committee on Electronic Information and Communication*. The CEIC (www.math.ceic.ca) continues to make slow, but hopefully steady, progress on its charter, on issues of metadata, digital publishing, copyright and intellectual property.

In addition to writing a detailed report for the IMU Executive in Beijing, and producing such “best practice advisories”, a principal goal is the development of a world-wide *MathNet* that allows one to obtain information about mathematicians and mathematics. The two primary steps are the installation of “secondary home pages” (institutional, departmental, and

individual) and the integration of preprint services.

Publications: The outstanding issue for the CMS is to reorganize its publishing activities. An ad-hoc subcommittee was struck in October 2000 (chaired by Tom Salisbury) to consider these matters further. It triggered design of a business plan (now completed), to lead to a more coherent publication structure to commence in January 2003.

These matters are elaborated in the Executive Director's Report.

Executive Director: As I reported in the February issue, I am very pleased to say that at the December 2001 Board Meeting, Graham Wright's appointment as Executive Director for a further two years (July 2002 – June 2004) was approved. I want to express my own deep gratitude for all that Graham has offered to the CMS over the past 22 years.

www.cms.math.ca: The Winter Meeting also marked the public launch of a revised Society website. This has two main components. First, one may choose to navigate in French www.smc.math.ca or English www.cms.math.ca. Second, the 'look and feel' has been revamped. I hope that you are as pleased as I am with the hard work done by our Web Services Manager, Alan Kelm, and his team. While the process is not yet entirely complete — no web site ever is — comments and suggestions are always welcome.

Kabot: As a pleasant surprise, one of the CMS web-pages "Knot a Braid of Links" was picked by Scientific American (www.scientificamerican.com), of May 14th 2001, as one of the top 50 scientific resources on the web. As many of you will know Kabot has added a mathematical site every week since 1996 (the web stone age!). Congratulations are especially due to Bob Rosebrugh who started Kabot and

Nathalie Sinclair who has overseen it for the last three years.

Some Ongoing Issues

The Executive and Board have discussed a number of issues of concern for the long-term health of the Society. For example, the CMS Publishing Plan for 2003 and beyond, prize nominations, ways to increase membership, and the future structure of our meetings.

The Canadian Mathematical Science community is now exceptionally diverse and vigorous, including not only CAIMS, CMS, MITACS and the three Institutes, but now also the *Banff International Research Station* which will begin full operation in 2003. I offer my warmest congratulations to Robert Moodie (BIRS Director), Nassif Ghoussoub (PIMS) and David Eisenbud (MSRI and AMS President-Elect) who spear-headed this remarkable achievement.

Committee Chairs and the Executive are considering how, if at all, the structure of our semi-annual meetings might be changed. Should we offer short courses, a survey lecture series, professional development activities, and the like? I would be keen to hear opinions from members.

In Conclusion

As will be clear from my report, the Executive Director's and all the committee reports, the Society is for the most part thriving. I finish by observing, as evidenced above, that 2002 will see a markedly increased emphasis on fund raising, on membership recruitment, and on joint initiatives with other societies and groups.

The CMS 2002 Summer Meeting, hosted by Laval University (June 15 to 17) features a wide array of sessions and an impressive list of plenary, prize and session speakers. I look forward to seeing you in Quebec City this summer.

UPCOMING CONFERENCES

Fields Institute Anniversary Celebrations

Toronto, June 18-19, 2002

On June 18-19, 2002, the Fields Institute will be celebrating its 10th Anniversary with 2 days of lectures and visual displays celebrating the mathematicians and activities which have made Fields a unique research facility. Also scheduled is a reception for Fields alumni and friends and a banquet with keynote speaker, William Pulleyblank.

Founded in 1992, the Fields Institute was initially located at the University of Waterloo. The Fields Institute officially opened at its 222 College Street location on the campus of the University of Toronto on November 17, 1995. The building The Fields Institute occupies was designed specifically to accommodate its research functions and activities by Toronto architects Kuwabara Payne McKenna Blumberg.

The Institute is named for Canadian mathematician John Charles Fields (1863-1932), whose will established the International Medal for Outstanding Discoveries in Mathematics, now known as the Fields Medal.

Speakers

Stephen Cook, University of Toronto; Persi Diaconis, Stanford University; Marty Golubitsky, University of Houston; Vaughan Jones, University of California at Berkeley; Angus MacIntyre, University of Edinburgh; William Pulleyblank, IBM; Chris Rogers, University of Bath; Karl Rubin, Stanford University.

Registration is available at www.fields.utoronto.ca/programs/scientific/01-02/fields10anniversary/ Please email us at programs@fields.utoronto.ca to be informed of when registration is available or for additional information.

The Math in Moscow project

Christiane Rousseau, Université de Montréal

NSERC and the CMS are finalizing a joint project for financial support of Canadian students who wish to spend a semester at the Moscow Independent University in the MATH in MOSCOW program.

The Independent University of Moscow (IUM) is a small, elite institution of higher learning focusing primarily on mathematics. It was founded in 1991 at the initiative of a group of well known Russian research mathematicians, who now comprise the Academic Council of the University. Professors Pierre Deligne and Robert McPherson, both permanent members of the Institute for Advanced Study in Princeton, also played crucial roles in founding the Independent University. The American Mathematical Society has had a special (although not official) relationship with the institution as well, arranging for help in obtaining publications and helping financially during one especially difficult period.

Recently, the Independent University of Moscow created a new program, offering foreign students (undergraduate or beginning graduate students specializing in mathematics and/or computer science) the chance to spend a semester in Moscow studying within its MATH in MOSCOW program: www.mccme.ru/mathinmoscow.

The courses are taught in English. Besides mathematics courses, a Russian language course and a course in the history of Moscow (in English) are offered. For those who know enough Russian, courses in Russian literature and history (in Russian) are also available. The list of math courses mentioned above includes two courses in theoretical computer science.

The main feature of the Russian tradition of teaching mathematics has always been the development of a creative approach to studying mathematics from the outset, the emphasis being on problem solving rather than memorizing theorems. Indeed, for the Independent University, discovering mathematics under the guidance of an experienced teacher is the central principle of its program, and the MATH in MOSCOW program emphasizes in-depth understanding of carefully selected material rather than broad surveys of large quantities of material. Even in the treatment of the most traditional subjects, students are helped to explore significant connections with contemporary research topics. This is possible because most of the program's teachers are internationally recognized research mathematicians, and all of them have considerable teaching experience in English, typically in the U.S. or Canada. (All instruction is in English.)

The MATH in MOSCOW program provides a fifteen-week-long research experience for students, not only with other mathematically talented and highly motivated under-

graduates but also with some of the world's leading mathematicians. Students will be learning mathematics in an environment similar in spirit to that of an NSERC summer scholarship, but with much broader representation from a world-class international community. There are few better ways to prepare our most talented undergraduates for further work in mathematics.

The following excerpt is taken from material on the MATH in MOSCOW program on the IUM web site.

"We expect that the enrolment for all our courses will be small, so that the teachers will be able to work individually with all the students in the classroom as well as during consultation hours. Mathematics courses are taught with emphasis on problem solving rather than memorizing theory: this emphasis is characteristic of the Moscow school of mathematics.

"However, we do not expect that students in the Math in Moscow program have had extensive math problem solving experience. Our teachers are very attentive to student feedback; quizzes, tests, informal discussions allow them to control the level of the course, making it accessible to all the students taking it."

A list of titles of the courses available to program participants, together with a list of the faculty at IUM and those currently active in the MATH in MOSCOW program, can be found on the website: www.mccme.ru/mathinmoscow

CMS is extremely interested in encouraging and supporting our most talented Canadian mathematics students to take advantage of this phenomenal resource. Hence we are working to finalize a joint project with NSERC to offer scholarships to Canadian students so that they can attend the program. The CMS will advertise the program widely – both to mathematics and to computer science students. Moreover, we hope to administer three scholarships a year, funded jointly with NSERC. In the project students will apply both to the Moscow Independent University in order to register in the program and to CMS for financial support. A CMS committee will rank the applications and award the scholarships. The criteria used for ranking applications will be similar to the usual criteria for NSERC fellowships: research aptitude, students' academic record, scientific judgement, leadership abilities and communications skills.

It is very likely that a final agreement with NSERC will have occurred before this article appears (it was written before March 15). We invite you to consult the CMS website where you will find all details regarding the formal announcement of the joint CMS-NSERC project regarding the support of Canadian students to go to Math in Moscow.

DU BUREAU DU PRÉSIDENT

(see page 1 for the English version)

Reprise générale

L'année 2001 a été fort occupée à la Société, comme toujours. À titre de président, j'aimerais à nouveau vous rappeler l'ardeur au travail et l'efficacité du personnel de notre bureau administratif, ainsi que le grand nombre d'activités auxquelles participe la Société. Dans son rapport publié dans les Notes d'avril, le directeur administratif décrit les changements qui se sont produits au bureau.

Que nous nous comparions à d'autres associations canadiennes ou à des sociétés mathématiques étrangères, nous pouvons être très fiers du nombre et de la qualité de nos activités : Réunions et remises de prix annuelles, programme dynamique de publication, concours commandités pour élèves du secondaire et camps de mathématiques (il y en a eu onze cette en 2001 dans sept provinces), concours de bourses du fonds de dotation (qui finance, pour la troisième année [premier cycle complet], toute une gamme de projets très intéressants) et plus encore. *Pour de plus amples renseignements sur le concours, visitez le site de Camel au www.smc.math.ca/Grants/.*

Encore une fois, au coeur des activités de l'an dernier, les Réunions d'hiver et d'été, réalisées grâce au généreux soutien du Comité du programme national des trois instituts de recherche canadiens (Fields, CRM et PIMS) et du Réseau de centres d'excellence MITACS.

Réunions 2001 de la SMC

La Réunion d'été 2001 de la Société mathématique du Canada s'est déroulée du 2 au 4 juin à l'Université de la Saskatchewan. Nos Réunions, dont la qualité scientifique est devenue un standard que l'on tient maintenant pour acquis, sont toujours une excellente façon de nouer ou d'entretenir des amitiés au sein de la communauté mathématique.

Conformément à la formule habituelle, la Réunion comptait dix symposiums, des communications libres, quatre conférences principales et les conférences des lauréats des prix Jeffery-Williams et Krieger-Nelson. La conférence **Jeffery-Williams** a été prononcée par David Boyd, de l'Université de la Colombie-Britannique, second lauréat du prix Coxeter-James en 1979, et la conférence **Krieger-Nelson**, par Lisa Jeffrey, de l'Université de Toronto. Mentionnons aussi que le symposium sur la théorie des nombres était organisé en l'honneur de David Boyd, qui fête cette année son 60e anniversaire. Les quatre conférenciers principaux étaient : Georgia Benkart (Wisconsin), Zoe Chatzidakis (Paris 7), Geoffrey Grimmett (Cambridge) et Barry Simon (Caltech), M. De Witt Sumners (Florida State) a en outre donné une excellente conférence publique intitulée : «Calculating the secrets of life: Mathematics in Biology and Medicine». Les dix symposiums, qui ont attiré un grand nombre de participants, portaient sur les sujets suivants :

Analyse harmonique abstraite (Org. : Anthony Lau,

Université de l'Alberta, et Keith Taylor, Université de la Saskatchewan); *Topologie géométrique* (Org. : Alex Chigogidze et Ed Tymchatyn, Université de la Saskatchewan); *Théorie des graphes* (Org. : Brian Alspach et Denis Hanson, Université de Regina); *Théorie de Lie en dimension infinie et théorie de la représentation* (Org. : Stephen Berman, Université de la Saskatchewan); *Enseignement des mathématiques - Cognition et mathématiques* (Org. : Florence Glanfield, Université de la Saskatchewan); *Analyse matricielle* (Org. : Judi MacDonald, Université de Regina); *Algèbre en théorie des modèles* (Org. : Bradd Hart, Université McMaster/Institut Fields, F.-V. Kuhlmann et S. Kuhlmann, Université de la Saskatchewan); *Théorie des nombres (en l'honneur de David Boyd)* (Org. : Peter Borwein, Université Simon Fraser, et Michael Bennett, Illinois); *Études rigoureuses dans la mécanique statistique des modèles de réseaux* (Org. : Chris Soteris, Université de la Saskatchewan, et Stu Whittington, Université de Toronto); *Diffusion inverse et systèmes intégrables* (Org. : Jacek Szmigielski, Université de la Saskatchewan).

Toutes les activités scientifiques de la Réunion se sont déroulées sur le campus de l'Université de la Saskatchewan. D'autres activités qui ont précédé la Réunion, la réception d'ouverture et le banquet ont eu lieu à l'hôtel Delta Bessborough. Le lunch des participants du samedi 2 juin et le repas de dimanche et de lundi midi étaient compris dans les droits d'inscriptions, ce que les participants ont beaucoup apprécié.

Keith Taylor, directeur de la réunion, Christine Soteris, présidente du Comité d'organisation local, les organisateurs de séances ainsi que les autres collaborateurs du département de mathématiques local et du bureau administratif de la SMC ont droit à nos sincères remerciements. En somme, tant par le nombre de participants (285 participants, ce qui est excellent) que par sa qualité exceptionnelle, la Réunion d'été fut un franc succès.

La Réunion d'hiver 2001 de la Société mathématique du Canada s'est tenue à l'hôtel Toronto Colony du 8 au 10 décembre 2001. L'hôte de la Réunion était l'Université York. Comme pour toutes nos activités, nos Réunions reposent sur l'excellent travail d'une équipe d'organisation locale, que je remercie sincèrement au nom de la Société. Je tiens également à remercier le directeur de la Réunion, Tom Salisbury, le président du comité de logistique local, Juris Steprans, Stanley Kochman et plusieurs autres personnes du département de mathématiques hôte qui ont donné un coup de main à l'organisation. Un grand merci aussi à Monique Bouchard et au personnel du bureau administratif de la SMC.

À l'occasion de cette Réunion, nous avons également souligné les réalisations de cinq de nos collègues. Kai Behrend, de l'Université de la Colombie-Britannique, a prononcé la conférence Coxeter-James de la SMC; Nathan

Ng, de l'Université de la Georgie a donné la conférence du Prix de doctorat, et George Bluman, de l'Université de la Colombie-Britannique, a prononcé la conférence Adrien-Pouliot. On a aussi remis le Prix de la SMC pour service méritoire à James Timourian, de l'Université de l'Alberta. J'ai abordé plus en détail la Réunion d'hiver 2001 dans les Notes de février 2002.

Forum national sur l'enseignement

Le CA de la SMC a décidé d'organiser un forum national sur l'enseignement des mathématiques à Montréal du 16 au 18 mai prochain, avec réunion de suivi à peu près neuf mois plus tard en Ontario.

Ces rencontres devraient rassembler environ 200 personnes de toutes les provinces et des territoires, qui représenteraient les groupes qui s'intéressent à l'enseignement des mathématiques à la fin du primaire et au secondaire (à peu près de la 6^e à la 12^e année) ou qui prennent part aux décisions s'y rapportant. Les coorganisateurs sont Christiane Rousseau (UdeM) et George Bluman (UBC), qui s'occupent du programme scientifique, et le président du comité d'organisation local est Louis Charbonneau (UQAM).

Réunions conjointes

D'après une idée de Michel Waldschmidt, président de la Société Mathématique de France, la SMC participe à l'organisation d'un congrès conjoint réunissant plusieurs sociétés de mathématiques pures et appliquées qui aura lieu à Toulouse en juillet 2004. On s'attend à une excellente rencontre mathématique, qui se déroulera surtout en français.

Les rapprochements sont par ailleurs de plus en plus nombreux entre la SMC et la SCMAI. En effet, la Réunion d'été 2004 de la SMC, qui se tiendra à Halifax, se fera aussi en collaboration avec la SCMAI. Il s'agira de la deuxième rencontre SMC-SCMAI.

Autres activités récentes

Voici maintenant certaines des autres activités récentes de la Société. J'essaierai, dans la mesure du possible, de ne pas répéter les éléments déjà abordés dans d'autres rapports annuels, dont certains sont parus dans les Notes d'avril 2002 ou dans le présent numéro. Sans doute que certaines des activités comprises dans d'autres rapports du président sont maintenant plus détaillées dans le rapport du Comité d'avancement des mathématiques, dont j'assume aussi la présidence.

Congrès international des mathématiciens

L'organisation du prochain congrès de l'UMI, qui aura lieu à Beijing du 20 au 27 août 2002, va bon train. J'ai réussi à organiser une réception canadienne, dans le cadre du congrès, qui sera donnée à l'ambassade du Canada (édifice spectaculaire, à ce qu'on dit) par l'ambassadeur du Canada au Japon. La réception sera commanditée par la SMC et les trois instituts.

J'assume en outre la vice-présidence d'un comité de l'information et des communications électroniques de l'UMI. Ce comité (www.math.ceic.ca) progresse lentement, mais

sûrement (du moins nous l'espérons) en ce qui concerne la rédaction de sa charte, les questions liées aux métadonnées, la publication électronique, les droits d'auteur et la propriété intellectuelle.

En plus de rédiger un rapport détaillé qui sera présenté au Comité exécutif de l'UMI à Beijing et de produire un guide de «pratiques exemplaires», l'un des principaux objectifs du comité consiste à développer un réseau mondial, *MathNet*, où l'on pourrait trouver de l'information sur les mathématiciens et les mathématiques. Les deux premières étapes sont l'installation de «pages d'accueil secondaires» (pour établissements, départements et individus) et l'intégration de services de prêtirage.

Publications : La SMC doit maintenant s'attaquer à la réorganisation de ses activités de publication. En octobre 2000, un sous-comité spécial (sous la présidence de Tom Salisbury) a été chargé d'approfondir la question. Les discussions initiales ont mené à l'élaboration d'un plan d'affaires (maintenant terminé), qui nous permettra d'avoir une nouvelle structure de publication cohérente en janvier 2003.

Ces sujets sont traités plus en profondeur dans le rapport du directeur administratif.

Directeur administratif : Comme je l'écrivais dans les Notes de février, je suis très heureux de vous annoncer qu'à sa réunion de décembre 2001, le conseil d'administration a reconduit le mandat de Graham Wright au poste de directeur administratif pour deux autres années (juillet 2002 - juin 2004). Je tiens à exprimer personnellement toute ma gratitude à Graham pour tout ce qu'il a donné à la SMC depuis 22 ans.

www.cms.math.ca : La Réunion d'hiver a aussi marqué le lancement public du nouveau site Web de la Société. Le nouveau site se divise maintenant en deux : une partie française www.smc.math.ca et une partie anglaise www.cms.math.ca. De plus, on a revu la présentation du site. J'espère que vous êtes aussi satisfaits que moi du travail réalisé par notre gestionnaire de système, Alan Kelm, et son équipe. Le nouveau site n'est pas entièrement «fini» (aucun site ne l'est vraiment), mais nous sommes toujours ouverts à vos commentaires.

Kabol : Nous avons eu une belle surprise récemment : les pages «Knot a Braid of Links» du site Web de la SMC ont été choisies le 14 mai par Scientific American (www.scientificamerican.com) comme l'une des 50 meilleures ressources scientifiques sur le Web. Comme vous êtes sûrement nombreux à le savoir, Kabol ajoute un nouveau site mathématique par semaine à son répertoire depuis 1996 (l'âge de pierre du Web!). Toutes nos félicitations vont particulièrement à Bob Rosebrugh, qui a créé Kabol, et à Nathalie Sinclair, qui en est responsable depuis trois ans.

Quelques dossiers à l'étude

Le Comité exécutif et le Conseil d'administration discutent depuis un certain temps de dossiers ayant une incidence sur la prospérité financière à long terme de la Société, notam-

ment du plan de publication de 2003 et des années ultérieures, des candidatures aux prix de la SMC, de façons d'accroître le nombre de membres et de la structure de nos prochaines Réunions.

En ce moment, la communauté mathématique canadienne est exceptionnellement diversifiée et vigoureuse. Elle regroupe non seulement la SCMAI, la SMC, le réseau Mitacs et les trois instituts, mais aussi la **Station de recherche internationale de Banff - SRIB**, qui ouvrira officiellement ses portes en 2003. Toutes mes félicitations à Robert Moodie (Directeur de la SRIB), à Nassif Ghoussoub (Institut du Pacifique pour les sciences mathématiques) et à David Eisenbud (MSRI et président élu de l'AMS), qui sont à l'origine de cette remarquable réussite.

Les présidents de comités et le Comité exécutif ont amorcé la réflexion sur la pertinence de modifier la formule de nos Réunions semestrielles et, le cas échéant, sur la nouvelle for-

mule à adopter. Devrions-nous offrir des mini-cours, des séries de conférences, des activités de perfectionnement, etc.? J'aimerais bien connaître l'avis de nos membres à ce sujet.

En conclusion

Comme il ressort clairement de mon rapport, de celui du directeur administratif et de ceux des comités, la Société est généralement en excellente santé. En plus des activités susmentionnées, j'aimerais également mentionner qu'on verra, en l'an 2002, une intensification des efforts de financement, de recrutement de membres et des projets en collaboration avec d'autres groupes et sociétés.

La Réunion d'été 2002 de la SMC, qui se déroulera à l'Université Laval du 15 au 17 juin, offrira un programme très diversifié et une liste impressionnante de conférenciers principaux, de conférences de lauréats et de communications libres. Au plaisir de vous retrouver cet été à Québec!

CMS Winter Meeting 2002 December 8-10, 2002

Ottawa Marriott Hotel Ottawa, Ontario

We are happy to announce the provisional outline for the Canadian Mathematical Society Winter Meeting 2002. Look for the First Announcement in the September 2002 issue of the *CMS Notes* or at <http://www.cms.math.ca/Events/winter02/>

HOST : Department of Mathematics & Statistics, University of Ottawa.

PUBLIC LECTURE : **Robert Zuccherato** (Entrust).

PLENARY SPEAKERS : **James Arthur** (University of Toronto), **Rene Carmona** (Princeton University), **Victor Guillemin** (MIT), **Maciev Zworski** (Berkeley University).

PRIZES : **Coxeter-James Lecture**: **Lisa Jeffrey** (University of Toronto), **Doctoral Prize Lecture** and the **Adrien Pouliot Prize**.

SYMPOSIA : **Financial Mathematics**, Org: Luis Seco (Toronto); **Finite Elements**, Org: Roger Pierre (Laval); **History of Mathematics**, Org: Richard O'Lander (St. Johns N.Y.) and Ronald Sklar (St. Johns N.Y.), **Lie Algebras and Moonshine**, Org: Abdellah Sebbar (Ottawa) and Erhard Neher (Ottawa), **Mathematical Education**, Org: Thomas Steinke (OCCDSB); **Number Theory**, Org: Damien Roy (Ottawa) and Kenneth Williams (Carleton); **Operator Algebras**, Org: Thierry Giordano (Ottawa) and David Handelman (Ottawa); **Partial Differential Equations**, Org: Victor Ivrii (Toronto) and John Toth (Toronto); **"Real-World" Problems in Search of Solutions**, Org: André Dabrowski (Ottawa); **Representation Theory of Real and p-adic Groups**, Org: Jason Levy (Ottawa) and Monica Nevins (Ottawa); **Symplectic Geometry**, Org: Lisa Jeffrey (Toronto) and Eckard Meinrenken (Toronto); **Theory and Applications of Point Processes**, Org: Gail Ivanoff (Ottawa) and David McDonald (Ottawa); **Contributed Papers**, Org: to be announced.

MEETING DIRECTOR : Daniel Daigle (Ottawa).

LOCAL ARRANGEMENTS : Walter D. Burgess (Ottawa) and André Dabrowski (Ottawa).

CALL FOR NOMINATIONS / APPEL DE CANDIDATURES

CMS Publisher / Éditeur de la SMC

The Executive Committee of the Canadian Mathematical Society invites applications for the position of CMS Publisher.

The Publisher is appointed by the Board of Directors of the Canadian Mathematical Society (CMS) and reports to the CMS Executive Director. The appointment is usually for a four-year renewable term and, subject to an agreement with the host institution, will include some form of compensation (e.g. teaching release or research grant stipend) during the term of the appointment that is commensurate with the duties of this senior position.

The current major duties and responsibilities are outlined below and the incumbent may also take initiatives in other directions.

Major Duties and Responsibilities

1. To ensure that the publishing activities of the CMS are in accordance with the policies determined by the Board of Directors.
2. To develop and coordinate the publishing plans for the Society including, but not limited to, the promotion of all existing CMS periodicals and other publications, the acquisition of contract work for the CMS Publications Office, in consultation with the editors-in-chief of the respective series, to assist with the acquisition of manuscripts for the Society's existing series and other publications (for example, the ATOM Series, the CMS Books in Mathematics Series (published with Springer Verlag) and the CMS Tracts in Mathematics (published with the AMS), and the development of publication initiatives that augment the Society's publications program and provide additional publications revenues.
3. To ensure that all of the Society's periodicals are published in a timely manner.
4. In consultation with the CMS Executive Director and the CMS Membership and Publications Agent, to ensure that all periodical and other publications are effectively promoted to members, subscribers and others.
5. To monitor the CMS web site publications pages, to ensure that the information provided is accurate and, in consultation with the CMS Executive Director and the Director of CMS Electronic Products and Services, that the CMS web site offers the proper level of service to subscribers, members and others, and that the web site effectively promotes the Society's publications.
6. To review the subscription services provided by the CMS Executive Office and to make recommendations to the Executive Director as necessary.
7. To recommend improvements, changes in policy and other matters related to the Society's publications programme.
8. To assist with the budget preparations and other financial matters for the Society's Publications Division and, in consultation with the CMS Executive Director, to ensure that the Publications Division operates within the budget approved by the CMS Board of Directors.
9. The Publisher is an ex-officio (non-voting) member of the CMS Publications Committee and participates in the meetings of other committees as appropriate.

If further information is required please contact the CMS Executive Director. **The deadline for receipt of applications is June 30, 2002.**

Applications, with supporting material or comments, should be sent to the address below:

Le Comité exécutif de la Société mathématique du Canada lance un appel de candidatures pour le poste d'éditeur de la SMC.

L'éditeur est nommé par le Conseil d'administration de la Société mathématique du Canada (SMC) et relève du directeur administratif de la SMC. Le mandat est généralement de 4 ans renouvelable, conditionnel à une entente avec l'établissement du candidat choisi, et comprend une forme d'indemnisation (réduction de la charge d'enseignement, allocation provenant d'une bourse de recherche, etc.) pendant la durée du mandat, à la hauteur des fonctions de ce poste de direction.

Les principales fonctions et responsabilités du titulaire de ce poste sont décrites ci-dessous. Le titulaire pourra prendre d'autres initiatives s'il le souhaite.

Principales Fonctions et Responsabilités

1. Veiller à ce que les activités de publication de la SMC soient conformes aux lignes directrices établies par le Conseil d'administration.
2. Élaborer et coordonner les plans de publication de la Société, notamment : promouvoir les périodiques et autres publications de la SMC; chercher des contrats pour le bureau de publication de la SMC, en collaboration avec les rédacteurs en chef des collections, pour favoriser l'acquisition de manuscrits destinés à enrichir

les collections de la Société et ses autres publications (ATOM, Ouvrages de mathématiques de la SMC [publiés par Springer Verlag], Traités de mathématiques de la SMC [publiés avec l'AMS], etc.); élaborer des projets de publication qui enrichiront les activités de publication de la Société et rapporteront des recettes supplémentaires.

3. Veiller à ce que les périodiques de la Société paraissent aux dates prévues.
4. En collaboration avec le directeur administratif et la responsable des adhésions et des publications de la SMC, assurer la promotion des périodiques et autres publications auprès des membres, des abonnés et des autres lecteurs.
5. Superviser la publication du contenu du site Web de la SMC pour assurer l'exactitude de l'information publiée et, en collaboration avec le directeur administratif et le directeur des produits et des services électroniques de la SMC, veiller à ce que le site de la SMC offre des services adéquats aux abonnés, aux membres et autres internautes, et qu'il fasse la promotion efficace des publications de la Société.
6. Examiner les services d'abonnement offerts par le bu-

reau administratif de la SMC et faire des recommandations au directeur administratif au besoin.

7. Recommander des améliorations ou des modifications aux directives et à d'autres aspects liés au programme de publication de la Société.
8. Participer à l'établissement du budget et à d'autres dossiers de nature financière pour le secteur des publications de la Société et, en collaboration avec le directeur administratif de la SMC, veiller à ce que les activités de publication de la Société respectent le budget approuvé par le Conseil d'administration de la SMC.
9. L'éditeur est membre d'office (sans droit de vote) du Comité de publication de la SMC et participe aux réunions des autres comités si nécessaire.

Pour de plus amples renseignements, veuillez communiquer avec le directeur administratif de la SMC. **Les candidatures doivent parvenir au bureau de la SMC au plus tard le 30 juin 2002.**

Faire parvenir sa mise en candidature, accompagnée des documents demandés ou de commentaires, à l'adresse suivante :

Dr. Graham Wright, Executive Director / Directeur administratif
CMS Executive Office / Bureau administratif de la SMC
 577 King Edward, Suite 109
 C.P. 450, Station A
 Ottawa, Ontario K1N 6N5
 director@cms.math.ca

Coxeter-James / Jeffery-Williams / Krieger-Nelson Prize Lectureships Prix de conférence Coxeter-James / Jeffery-Williams / Krieger-Nelson

The CMS Research Committee is inviting nominations for three prize lectureships.

The Coxeter-James Prize Lectureship recognizes outstanding young research mathematicians in Canada. The selected candidate will deliver the prize lecture at the Winter 2003 Meeting in Vancouver, British Columbia. Nomination letters should include at least three names of suggested referees.

The Jeffery-Williams Prize Lectureship recognizes outstanding leaders in mathematics in a Canadian context. The prize lecture will be delivered at the Summer 2004 Meeting in Halifax, Nova Scotia. Nomination letters should include three names of suggested referees.

The Krieger-Nelson Prize Lectureship recognizes outstanding female mathematicians. The prize lecture will be

delivered at the Summer 2004 Meeting in Halifax, Nova Scotia. Nomination letters should include three names of suggested referees.

The deadline for nominations is **September 1, 2002**. Letters of nomination should be sent to the address below.

Le Comité de recherche de la SMC invite les mises en candidatures pour les trois prix de conférence de la Société, la Conférence Coxeter-James, la Conférence Jeffery-Williams et la Conférence Krieger-Nelson.

Le prix Coxeter-James rend hommage à l'apport exceptionnel des jeunes mathématiciens au Canada. Le candidat choisi présentera sa conférence lors de la réunion d'hiver 2003 à Vancouver (Columbie Britannique). Les lettres de mises

en candidatures devraient inclure les noms d'au moins trois répondants possibles.

Le prix Jeffery-Williams rend hommage à l'apport exceptionnel des mathématiciens d'expérience au Canada. La Conférence sera présentée lors de la réunion d'été 2004 à Halifax (Nouvelle Écosse). Les lettres de mises en candidature devraient inclure les noms d'au moins trois répondants possibles.

Le prix Krieger-Nelson rend hommage à l'apport exceptionnel des mathématiciennes au Canada. La Conférence sera présentée lors de la réunion d'été 2004 à Halifax (Nouvelle Écosse). Les lettres de mises en candidatures devraient inclure les noms d'au moins trois répondants possibles.

La date limite pour les mises en candidatures est **le 1er septembre 2002**. Les lettres de mises en candidatures devraient être envoyées à :

Douglas Stinson
CMS Research Committee / Comité de recherche de la SMC
Department of Pure Mathematics
University of Waterloo
200 University Ave West
Waterloo, ON Canada
N2L 3G1

UNIVERSITÉ DE MONTRÉAL – MONTRÉAL, QUEBEC
DÉPARTEMENT DE MATHÉMATIQUES ET DE STATISTIQUES
Poste en mathématiques fondamentales

Le Département de mathématiques et de statistique de la Faculté des arts et des sciences de l'Université de Montréal recherche une professeure ou un professeur au rang d'adjoint ou d'agrégé à plein temps en mathématiques fondamentales. Pour toute information sur le Département et le Centre de recherches mathématiques avec qui le Département entretient des liens étroits, veuillez visiter les sites www.dms.umontreal.ca et www.crm.umontreal.ca.

Fonctions : Enseignement aux trois cycles, encadrement d'étudiants aux cycles supérieurs, activités de recherche.

Exigences : Détenir un doctorat en mathématiques. La préférence sera accordée aux candidates et candidats possédant une expertise en topologie algébrique avec des compétences en systèmes dynamiques, en théorie de Morse (classique et en dimension infinie) et en analyse globale sur les variétés. La qualité du dossier en recherche est primordiale. La candidate ou le candidat doit démontrer une excellente aptitude en enseignement. Une expérience de l'enseignement universitaire sera privilégiée. L'enseignement à l'Université de Montréal se fait en français.

Traitement : L'Université de Montréal offre un salaire concurrentiel jumelé à une gamme complète d'avantages sociaux.

Date d'entrée en fonction : Le 1er janvier 2003 ou le 1er juin 2003.

Les personnes intéressées doivent faire parvenir un curriculum vitae complet incluant une courte description des intérêts de recherche, au moins trois lettres de recommandation et au maximum trois tirés à part des plus importantes contributions à la recherche, et ce **avant le 15 août 2002** à :

Directeur
Département de mathématiques et de statistique
Université de Montréal
C.P. 6128, succursale Centre-ville
Montréal QC H3C 3J7
Phone: (514) 343-6743
FAX: (514) 343-5700
email: directeur@dms.umontreal.ca

Conformément aux exigences prescrites en matière d'immigration au Canada, cette annonce s'adresse en priorité aux citoyens canadiens et aux résidents permanents. L'Université de Montréal souscrit à un programme d'accès à l'égalité en emploi pour les femmes et au principe d'équité en matière d'emploi.

2002 ENDOWMENT GRANTS COMPETITION

CONCOURS DE BOURSES DU FONDS DE DOTATION 2002

CALL FOR PROPOSALS / APPEL DE PROPOSITIONS

The Canadian Mathematical Society is pleased to announce a new grants competition to fund projects that contribute to the broader good of the mathematical community. A portion of the annual income from the CMS Endowment Fund will be used to fund such projects and an Endowment Grants Committee (EGC) will administer the distribution of the grants and will adjudicate proposals for projects.

Proposals must address the goal and statement of purpose of the Canadian Mathematical Society:

The goal of the Canadian Mathematical Society is to support the promotion and advancement of the discovery, learning, and application of mathematics. The CMS Statement of Purpose is:

1. To unify and support Canadian mathematicians through effective communication, broad membership, sponsorship of diverse activities, and partnerships with like professional societies.
2. To support mathematics research through the communication of current research to both the specialist and non-specialist, public recognition of research accomplishments and collaboration with the research institutes and granting agencies.
3. To support the advancement of mathematics education through joint projects with mathematics educators at all levels, promotion of educational advancements, and partnerships with provincial ministries of education and organizations supporting mathematics education.
4. To champion mathematics through initiatives that explain, promote and increase the general understanding of mathematics, provide extra-curricula opportunities for students, and encourage partnerships with corporate, government and not-for-profit agencies.

An applicant may be involved in only one proposal per competition as a principal applicant. Proposals must come from CMS members, or, if joint, at least one principal applicant must be a CMS member.

The EGC will consider funding proposals for a maximum of three years. However, multi-year proposals must be funded from the funds available to the EGC in the year of application. The EGC will consider funding proposals to a maximum of \$5,000 per year.

The EGC committee intends to favour proposals where CMS funds can be leveraged or where proposals have no other natural funding body to which to apply.

If it is anticipated that a proposal will generate something of lasting financial value, proposers must indicate that this is the case and declare their intent with respect to that value.

An application form, advice and directions are available at the CMS website www.cms.math.ca/Grants/. Proposers will have ample opportunity to sell their ideas to the EGC.

We hope to be able to have an applicant fill out the application on an HTML form and submit it electronically. If that does not work, we will accept a hard copy as an e-mail attachment using either the Microsoft Word template or the \LaTeX template available for downloading from the CMS web site given above. Send the proposal as an attachment to the e-mail address chair-egc@cms.math.ca. We would also accept a proposal in these templates sent as hard copy to the CMS Executive Office. If you have any immediate questions on the program or the application process please e-mail the Chair of the EGC, Kathryn Hare, at chair-egc@cms.math.ca. If you plan on applying, the committee would find it extremely useful if you sent the Chair an e-mail expressing your interest as soon as possible.

Proposals must be received at the CMS Executive Office or electronically by the EGC committee no later than **September 30, 2002**.

Proposals should be sent to the following address:

2002 CMS Endowment Grants Competition
Canadian Mathematical Society
577 King Edward, Suite 109
P.O. Box 450, Station A
Ottawa, Ontario
K1N 6N5

Again, the relevant electronic addresses are www.cms.math.ca/Grants/ for directions, forms, advice and electronic form submission; chair-egc@cms.math.ca for e-mail contact with the Chair of the EGC and for submission of a proposal as an attached file to an e-mail.

La Société mathématique du Canada (SMC) est heureuse d'annoncer la tenue d'un nouveau concours de bourses pour le financement d'activités qui contribuent à l'essor global de la communauté mathématique. Une partie des recettes annuelles tirées du Fonds de dotation de la SMC servira à financer de telles activités. Le Comité d'attribution des bourses

du fonds de dotation (CABFD) se chargera d'évaluer les propositions et d'attribuer les bourses.

Les propositions doivent être conformes à l'objectif et à l'énoncé d'intention de la SMC :

La Société mathématique du Canada s'est donnée pour objectif de promouvoir et de favoriser la découverte et l'apprentissage des mathématiques, et les applications qui en découlent. Son énoncé d'intention est le suivant :

1. Regrouper et appuyer les mathématiciens canadiens en favorisant la communication et l'adhésion à grande échelle, en commanditant diverses activités et en établissant des partenariats avec des associations professionnelles semblables à la nôtre.
2. Encourager la recherche mathématique en diffusant les résultats de recherches en cours aux spécialistes et aux non-spécialistes, en faisant reconnaître publiquement les travaux de chercheurs et en collaborant avec les instituts de recherche et les organismes subventionnaires.
3. Favoriser l'apprentissage des mathématiques en réalisant des projets avec des professeurs de mathématiques de tous les niveaux, en faisant connaître les progrès dans l'enseignement et en établissant des partenariats avec les ministères de l'éducation provinciaux et les organismes voués à l'apprentissage des mathématiques.
4. Défendre les mathématiques en créant des initiatives visant à expliquer, à promouvoir et à mieux faire connaître la discipline, en organisant des activités parascolaires et en encourageant les partenariats avec les sociétés privées, les gouvernements et les organismes à but non lucratif.

Un demandeur ne peut présenter qu'une proposition par concours en tant que demandeur principal. Les propositions doivent venir de membres de la SMC. S'il s'agit d'un projet conjoint, au moins un des demandeurs principaux doit être membre de la SMC.

Le CABFD évaluera les projets qui s'étalent sur un maximum de trois ans. Les projets s'échelonnant sur plusieurs années seront toutefois financés en fonction des fonds dont disposera le Comité l'année de la demande. Le Comité se limitera aux propositions dont le financement demandé n'excède pas 5 000 \$ par année.

Le CABFD désire privilégier les propositions où les fonds de la SMC peuvent être équilibrés ou les propositions qui ne disposent d'aucun organisme de financement naturel où postuler.

Si les demandeurs prévoient tirer une valeur financière durable du projet, ils doivent l'indiquer et expliquer ce qu'ils ont l'intention d'en faire.

Le formulaire de demande, les instructions pertinentes et des conseils est disponible au site de la SMC www.smc.math.ca/Grants/. Ainsi, les proposants auront tout le temps voulu pour vendre leurs idées au CABFD.

Nous espérons qu'il sera possible de remplir la demande en format HTML et de la soumettre électroniquement mais sinon, nous accepterons les fichiers annexés à un message de courriel réalisés à l'aide des documents types de format Microsoft Word ou \LaTeX téléchargeables à partir du site Web de la SMC, à l'adresse suivante : pres-egc@smc.math.ca. Nous accepterons aussi les copies imprimées de ces documents types au bureau administratif de la SMC. Pour toute question sur le programme ou sur le processus de demande, prière d'envoyer un message par courriel à la présidente du CABFD, Kathryn Hare, à l'adresse suivante : pres-egc@smc.math.ca. Si vous prévoyez faire une demande, le Comité vous saurait gré de lui faire part de votre intérêt le plus tôt possible en faisant parvenir un message par courriel à sa présidente.

Les propositions doivent parvenir au bureau administratif de la SMC au plus tard **le 30 septembre 2002**.

Envoyer les propositions à l'adresse suivante :

Concours de bourses du fonds de dotation 2002
Société mathématique du Canada
577, avenue King-Edward, bureau 109
C. P. 450, succursale A
Ottawa (Ontario)
K1N 6N5

Rappel - liste des adresses pertinentes : www.smc.math.ca/Grants/ : instructions, formulaires, conseils, envoi du formulaire électronique; pres-egc@smc.math.ca : pour communiquer avec le président du CABFD et envoyer vos demandes en annexe à un message de courriel.

NOTICE

The Executive Office will be closed for two weeks this summer from **August 5th to the 16th inclusive**.

AVIS

Le Bureau d'administration sera fermé pour deux semaines cette été du **5 au 16 août**.



THE UNIVERSITY OF BRITISH COLUMBIA

Head, Department of Mathematics

The Faculty of Science at the University of British Columbia is seeking applications for the position of Head of the Department of Mathematics. The Department, which currently consists of 51 professors, 2 instructors/lecturers, 55 graduate students and 10 support staff, is committed to excellence in research and education. The department is an advocate of the key interdisciplinary role of the mathematical sciences and is committed to its current programs of industrial and education outreach.

The department contributes essential scientific leadership for the Pacific Institute for the Mathematical Sciences (PIMS), for the MITACS Network of Centres of Excellence, for the Banff International Research Station (BIRS) and for the Institute of Applied Mathematics (IAM). Further information about the department can be found at <http://www.math.ubc.ca>.

We seek a dynamic individual with an excellent international research profile, a strong commitment to educational programs at both the undergraduate and graduate level, an articulate vision for the future of the Mathematics Department at UBC, and demonstrated leadership abilities, including management, organisational, and people skills. The successful candidate will be a strong advocate for the Department within the University and on the national and international scenes.

The position is available beginning July 01, 2002 but a later start date is negotiable. The University of British Columbia hires on the basis of merit and is committed to employment equity. All qualified persons are encouraged to apply; however, Canadians and permanent residents will be given priority.

The deadline for applications is June 01, 2002, but applications will be processed as soon as they are received. Applications, including a curriculum vitae, publication list and the names and addresses (including e-mail addresses when possible) of at least three references, should be sent as soon as possible to:

Dr. Maria Klawe
Dean of Science
University of British Columbia
6270 University Blvd.
Vancouver, BC
Canada V6T 1Z4

Tel: (604) 822-3337
Fax: (604) 822-0677
E-mail: scidean@interchange.ubc.ca

CONCORDIA UNIVERSITY – MONTREAL, QUEBEC DEPARTMENT OF MATHEMATICS AND STATISTICS

The Department of Mathematics and Statistics at Concordia University invites applications for a tenure-track position in Mathematical Physics and related fields. The position is at the rank of an Assistant Professor, to start September 1, 2002.

Applicants should have a demonstrated interest in teaching at both the undergraduate and graduate levels, and a proven record of research in areas relating to current work on integrable ODE's and PDE's with physical applications, as well as group theoretical and geometric methods. Preference will be given to candidates with postdoctoral experience and with computational expertise (use of high-level symbolic languages and computer-supported techniques in mathematical research and teaching).

Candidates should send a current CV with statements of their research and teaching interests and three letters of recommendation to:

Dr. Hershy Kisilevsky
Chair, Department of Mathematics and Statistics
Concordia University,
7141 Sherbrooke St. W., Suite HB-200
Montreal, Quebec, H4B 1R6

Review of applications will begin on June 3, 2002 and continue until the position is filled.

The position is subject to budgetary approval. For more information about Concordia's Department of Mathematics and Statistics, visit us on the Web at <http://www.mathstat.concordia.ca/>

All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority. Concordia University is committed to Employment Equity and encourages applications from women, aboriginal peoples, visible minorities and disabled persons.

CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

MAY 2002

3-4 Workshop on Topology in Computer Science (City College, City University of New York, N.Y.)
<http://topann.home.att.net>

3-5 AMS Eastern Section Meeting (CRM, Université de Montréal)
<http://www.ams.math.org/meetings/>

17-31 6th PIMS Industrial Problem Solving Workshop (UBC, Vancouver, BC)
frigaard@math.ubc.ca

19-25 Canadian Number Theory Association Conference (CRM, Université de Montréal, Montréal)
<http://www.math.mcgill.ca/cnta7>

24-26 Annual Meeting, Canadian Society for History and Philosophy of Mathematics / Société canadienne d'histoire et de philosophie des mathématiques (University of Toronto)
<http://www.cshpm.org>

24-28 25th Anniversary Meeting of the Canadian Mathematics Education Study Group (CMESG), (Queen's University, Kingston, ON)
david.reid@acadiau.ca

MAI 2002

27-June 10 Computational Lie Theory (CRM, Université de Montréal, Montréal)
activites@crm.umontreal.ca
<http://www.CRM.UMontreal.CA/geometry/>

JUNE 2002

3-8 Abel Bicentennial Conference 2002 (University of Oslo, Oslo, Norway)
<http://www.math.uio.no/abel/conference/index.html>

3-9 BIOCAMP 2002: Topics in Biomathematics and related computational problems at the beginning of the third millennium (Vietri sul Mare (Amalfi coast), Italy)
<http://www.dma.unina.it/biocomp/>

4-13 Linear Algebra Workshop (Bled, Slovenia)
luzius@mathstat.dal.ca, <http://www.ijp.si/ftp/pub/stop/law/>

6-8 CAIMS 2002 (University of Calgary)
[Samuel Shen: shen@maildrop.srv.ualberta.ca](mailto:Samuel.Shen@maildrop.srv.ualberta.ca)

6-8 Conference on zero-dimensional schemes and related topics, in honor of Tony Geramita's 60th birthday (Acireale, Italy (Sicily))
<http://cocoa.dima.unige.it/conference/acireale/first.html>

10-15 Algebraic Transformation Groups (CRM, Université de Montréal, Montréal)

JUN 2002

activites@crm.umontreal.ca,

http://www.CRM.UMontreal.CA/geometry/

15– 17 CMS Summer Meeting / Réunion d'été de la SMC (Université Laval, Québec, Québec)

http://www.cms.math.ca/Events/summer02/

17–21 Seventh International Conference on p-adic Functional Analysis, (University of Nijmegen, The Netherlands)

http://www.sci.kun.nl/math/p-adic2002/

17–21 Householder Symposium on Numerical Linear Algebra (Peebles Hydro Hotel, near Edinburgh, Scotland)

p.a.knight@strath.ac.uk

http://www.maths.strath.ac.uk/matrix/

18–19 Fields Institute Anniversary Celebrations (Toronto, Canada)

programs@fields.utoronto.ca

24–28 Special Activity in Analytic Number Theory (Max Planck Institute, Bonn) *moroz@mpim-bonn.mpg.de*

25–28, 8th International Conference on Applications of Computer Algebra (Volos, Greece)

http://www.uth.gr, http://www.volos-m.gr

JULY 2002

JUILLET 2002

1–5 Congrès à la memoire de Jacques-Louis Lions (College de France, Paris)

http://acm.emath.fr/congres-jllions/

7–12 The 5th Americas Conference in Differential Equations and Nonlinear Dynamics (University of Alberta, Edmonton)

http://www.math.ualberta.ca/mli/americas.htm

email: mli@math.ualberta.ca

8–19 SMS-NATO ASI: Normal Forms, Bifurcations, and Finiteness Problems in Differential Equations (Université de Montréal, Montréal)

http://www.dms.umontreal.ca/sms

15– Aug 10 Conference on Representation Theory of Algebras and Related Topics (ICRA X) (The Fields Institute for Research in Mathematical Sciences, Toronto)

icrax@fields.utoronto.ca

22–30 44th International Mathematical Olympiad (University of Strathclyde, Glasgow, UK)

22–Aug 16 Atlantic Association for Research in the Mathematical Sciences Summer School (Memorial University of Newfoundland, St. John's)

http://www.math.mun.ca/aarms/SS2002

or email Edgar Goodaire (edgar@math.mun.ca)

28– Aug 17 Summer Graduate Workshop in Matrix Theory (University of Regina, Regina, SK)

gradapps@math.uregina.ca

http://www.math.uregina.ca/workshop/

31–Aug 3 Novel Kananaskis Symposia on Pressure Distribution

www.wcb2002.com, info@wcb2002.com

AUGUST 2002

AOÛT 2002

2–3 Banff Symposia on Skeletal Muscle

www.wcb2002.com, info@wcb2002.com

3–10 Logic Colloquium 2002, ASL European Summer Meeting (WestfWilhelms-Universität, München, Germany)

http://www.math.uni-muester.de/LC2002

4–9 World Congress of Biomechanics

www.wcb2002.com, info@wcb2002.com

7–12 Marsden Workshop on Geometry, Mechanics and Dynamics (The Fields Institute for Research in Mathematical Sciences, Toronto)

marsden60@fields.utoronto.ca

14–18 Satellite Conference(of ICM 2002) on Operator Algebras and Applications (Hebei University of Technology, Chengde, Hebei, China)

http://www.oainchina.org

15–18 The International Conference on Mathematical Biology (a satellite meeting of ICM-2002)(Guangxi Normal University, Guilin, Guangxi Province, PR China)

gxnu@public.glppt.gx.cn

20–28 International Congress of Mathematicians (Beijing, China) *http://icm2002.org.cn/*

25–Sept 1 40th International Symposium on Functional Equations (Gronow, Poland)

isfe40@uz.zgora.pl,

http://www.isfe40.uz.zgora.pl

SEPTEMBER 2002

SEPTEMBRE 2002

9–20 Axiomatic, Enriched and Motivic Homotopy Theory (NATO Advanced Study Institute) (Issac Newton Institute for Mathematical Sciences, Cambridge, U. K.)

t.andrew@newton.cam.ac.uk,

http://www.newton.cam.ac.uk/programs/NST/nstw01.html

23–28 Workshop on Categorical Structures for Descent and Galois Theory, Hopf Algebras and Semiabelian Categories, (The Fields Institute for Research in Mathematical Sciences, Toronto)

tholen@mathstat.yorku.ca

29–Oct 3 18th International CODATA Conference (Hotel Delta Centreville, Montreal, Que)

codata@dial.oleane.com, http://www.codata.org

30–Oct 4 K-theory and Arithmetic (Issac Newton Institute for Mathematical Sciences, Cambridge, U. K.)

t.andrew@newton.cam.ac.uk,

http://www.newton.cam.ac.uk/programs/NST/nstw01.html

OCTOBER 2002

OCTOBRE 2002

17 – 19 NCTM Canadian Regional Conference (Regina, Saskatchewan) Hosted by the Saskatchewan Mathematics Teachers' Society.

http://www.nctm.org/, http://mathcentral.uregina.ca/SMTS/

DECEMBER 2002

**8–10 CMS Winter Meeting / Réunion d’hiver de la SMC
(Marriott Hotel, Ottawa, Ontario)**

<http://www.cms.math.ca/Events/winter02/index.html>

JANUARY 2003

**Jan – Aug Thematic Program on Automorphic Forms,
(The Fields Institute for Research in Mathematical Sciences,
Toronto)**

Automorphic@fields.utoronto.ca

FEBRUARY 2003

**10–15 Mathématiques Appliquées et Applications des Mathématiques
(Nice, France)**

<http://www.acm.emath.fr/amam/>

JUNE 2003

**14–16 CMS Summer Meeting / Réunion d’été de la SMC
(University of Alberta, Edmonton, Alberta)**

[Monique Bouchard: meetings@cms.math.ca](mailto:Monique.Bouchard@cms.math.ca)

**17–21 Fourth Butler Memorial Conference (University of Alberta,
Edmonton, Alberta, Canada)**

DÉCEMBRE 2002

<http://conley.math.ualberta.ca/butler.html>

JULY 2003

**27 - Aug. 9 Banach algebras and their applications (University of Alberta,
Edmonton, AB)**

<http://www.math.ualberta.ca/ba03/>

DECEMBER 2003

**6–8 CMS Winter Meeting / Réunion d’hiver de la SMC
(Simon Fraser University, Harbour Centre, Vancouver,
British Columbia)**

[Monique Bouchard: meetings@cms.math.ca](mailto:Monique.Bouchard@cms.math.ca)

SUMMER 2004

**CMS Summer Meeting / Réunion d’été de la SMC
(Dalhousie University, Halifax, Nova Scotia)**

[Monique Bouchard: meetings@cms.math.ca](mailto:Monique.Bouchard@cms.math.ca)

DECEMBER 2004

**CMS Winter Meeting / Réunion d’hiver de la SMC
(McGill University, Montréal, Québec)**

[Monique Bouchard: meetings@cms.math.ca](mailto:Monique.Bouchard@cms.math.ca)

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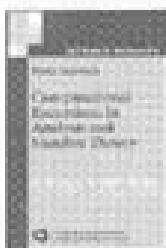
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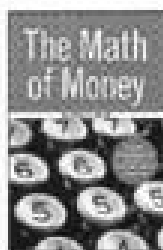
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