

IEEE Information Theory Society Newsletter



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Annual IT Awards Announced

The principal annual awards of the Information Theory Society were announced at the 2010 ISIT, in Austin. The 2011 Shannon Award goes to Shlomo Shamai. The 2010 Wyner Award goes to Toby Berger. The winner of the 2010 IT Paper Award is the 2009 IT Transactions paper on Polar Codes by Erdal Arıkan. The winner of the 2010 Joint IT/ComSoc Paper Award is the 2008 IT Transactions paper on coding for errors and erasures, by Ralf Koetter and Frank Kschischang. Five student authors of ISIT papers received the 2010 ISIT Student Paper Award: Yury Polyanskiy of Princeton, Jayadev Acharya of UCSD, Yashodhan Kanoria of Stanford, Arya Mazumdar of University of Maryland and Benjamin Kelly of Cornell. Finally, the 2010 Chapter of the Year Award was presented to the Russia Chapter.



Shlomo Shamai



Toby Berger

G. Fink Prize Paper Award, the 2003, and the 2004 Joint IT/COM Societies Paper Award, and the 2007 Information Theory Society Paper Award. He has served as Associate Editor for the Shannon Theory of the IEEE Transactions on Information Theory and served on the Board of Governors of the Information Theory Society. He will give the Shannon Lecture at the 2011 ISIT in Saint Petersburg, Russia.

The Aaron D. Wyner Distinguished Service Award recognizes an "individual who has shown outstanding leadership in, and provided longstanding exceptional service to, the information theory community." Toby Berger, Professor with the Department of Electrical and Computer Engineering University of Virginia, has served in every major role of the IT Society, including President (1979), Editor-in-Chief of the Transactions (1987–1989) and General Co-Chair of the 1977 ISIT in Ithaca, NY.

The Claude E. Shannon Award, awarded for "consistent and profound contributions to the field of information theory," is the highest honor of the IT Society. Shlomo Shamai joined the Department of Electrical Engineering at Technion in 1986, where he is now the William Fondiller Professor of Telecommunications. He has co-authored over 170 journal papers. His research interests encompass a wide spectrum of topics in information theory and statistical communications. He is especially interested in theoretical limits in communication with practical constraints, multi-user information theory and spread spectrum systems, multiple-input-multiple-output communications systems, information theoretic models for wireless networks and systems, information theoretic aspects of magnetic recording, channel coding, combined modulation and coding, turbo codes and LDPC, in channel, source, and combined source-channel applications, iterative detection and decoding algorithms, coherent and noncoherent detection and information theoretic aspects of digital communication in optical channels. Dr. Shamai (Shitz) is an IEEE Fellow and a member of the Union Radio Scientifique Internationale (URSI). He is the recipient of the 1999 van der Pol Gold Medal of URSI, and a co-recipient of the 2000 IEEE Donald

The Information Theory Society Paper Award is given annually to an outstanding publication in the fields of interest to the Society appearing anywhere during the preceding two calendar years. The winners of the 2010 award is "*Channel Polarization: A Method for Constructing Capacity-Achieving Codes for Symmetric Binary-Input Memoryless Channels*", by E. Arıkan, which appeared in the July 2009 IEEE Transactions on Information Theory. This paper introduces a new phenomenon termed *Channel Polarization* and introduces a particular recursive construction of codes, namely, Polar Codes, that exploits channel polarization through a successive decoding algorithm. It shows that these codes and their matching decoding algorithm achieve the capacity of any binary memoryless symmetric channel with decoding complexity $O(n \log(n))$. Arıkan's paper has already spurred a very significant amount of research on Polar Codes and applications thereof.

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From the Editor

Tracey Ho



Dear IT Society members,

The highlight of this issue is the announcement of the annual IT Society awards. Warmest congratulations to the award winners for all your achievements! This issue is also the first under the newly formed editorial committee. There are exciting articles in the pipeline for upcoming issues, so stay tuned.

As a reminder, announcements, news and events intended for both the printed newsletter and the website, such as award announcements, calls for nominations and upcoming conferences, can be submitted jointly at the IT Society website <http://www.itsoc.org/>, using the quick links "Share News" and "Announce an Event". Articles and columns that do not fall into the above categories should be e-mailed to me at tho@caltech.edu, with a subject line that includes the words "IT newsletter". The deadlines for the next few issues are:

Issue	Deadline
December 2010	October 10, 2010
March 2011	January 10, 2010
June 2011	April 10, 2010

Please submit ASCII, LaTeX or Word source files; do not worry about fonts or layout as this will be taken care of by IEEE layout specialists. Electronic photos and graphics should be in high resolution and sent as separate files.

I look forward to your contributions and suggestions for future issues of the newsletter.

Tracey Ho

IEEE

Information Theory Society Newsletter

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President's Column

Frank R. Kschischang

I have just returned from beautiful sunny Austin, Texas, where an enthusiastic team headed up by Benhaam Aazhang and Costas Georghiades organized a fantastic Symposium on Information Theory. As usual, the Symposium featured an outstanding technical program (organized by Michael Gastpar, Robert Heath, and Krishna Narayanan), with stimulating plenary talks from Michael Jordan, Abbas El Gamal, Tony Ephremides, and Ram Zamir. The highlight of the Symposium was the Shannon Lecture, entitled "Musing upon Information Theory," and delivered by Te Sun Han. The Symposium once again featured a number of events organized by the Student Committee, including Round Table Research Discussions and a Panel Discussion on "Recipes for a Good Talk," and the WithITS organized a very interesting event entitled "Yes, She Can." I am already looking forward with eager anticipation to next year's Symposium, to be held in Saint Petersburg, Russia.



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The Information Theory Society has an amazing web site (www.itsoc.org). If you haven't browsed there in a while, I would strongly encourage you to do so. More than merely a "web site," our web system is built on a powerful and flexible content management system called Plone, with Society-specific customizations implemented by Six Feet Up, Inc., all specified and developed under the watchful eye of the Society's Online Committee. Although many have contributed, the visionary who convinced the Society's Board of Governors to invest in this project, and who has led the development effort since its inception, is Online Editor Nick Laneman. Without Nick's outstanding leadership and stewardship, it is doubtful that we would have the cutting-edge online system that we have today.

If you point your web browser at www.itsoc.org, you will find all of the latest Society news, information about upcoming events (workshops, conferences, symposia), awards and honors, an archive of recent newsletters, the Society's bylaws and constitution,

lists of committees and their membership, information for authors, reviewers, conference organizers, and much more.

Of particular note and potential interest to all information theorists is the rapidly-expanding body of material filed online under the general heading of "Resources" (www.itsoc.org/resources). Here the Online Committee has gathered pointers to various materials; for example, textbooks in information theory and related fields, lecture notes and review articles, and even a few recent (and not-so-recent) doctoral dissertations. Members of the community are strongly encouraged to contribute to this

growing archive. For example, to post a link to a PhD dissertation, a member would simply need to register for an account, log in, and then from the "Dissertations" page fill out a brief form accessed via the "add new..." drop-down menu feature.

If you happened to miss the Shannon lecture or a plenary lecture from this year's ISIT, or, indeed, from any of the ISITs since 2006, you may be pleased to know that these have been recorded on video and are available to be downloaded by following the links from the "Media" page. Also of interest are lecture material and videos from the 2008 and 2009 Schools of Information Theory.

You may also wish to catch up with the activities of your local Chapter—simply follow the links from www.itsoc.org/people/chapters. Chapter chairs are encouraged to use their itsoc.org web space to keep their members informed of all upcoming and ongoing events.

It is my hope that our online web pages will grow into an invaluable resource for all members of our community, and I invite your contributions.

As always, if you would like to get more involved in the activities of the Society or share your comments, please contact me at frank@comm.utoronto.ca.

Annual IT Awards Announced continued from page 1

The Joint Information Theory and Communications Society Paper Award recognizes outstanding papers published in any publication of the Communications Society or the Information Theory Society during the previous calendar year. The winner of the 2010 award is "Coding for errors and erasures in random network coding," by R. Kotter and F. Kschischang, which appeared in the August 2008 IEEE Transactions on Information Theory. This paper provides a fresh perspective on network coding, viewing codewords as linear subspaces, and develops a new coding theory for this channel model by proposing highly original algebraic code constructions over the Grassmanian manifold. The coding methods revealed in this paper may have strong theoretical and practical impact and the paper is already highly cited.

The ISIT Student Paper Award is given annually to one or more outstanding papers in that year's IEEE International Symposium on Information Theory for which a student (or students) is the primary author, and is also the presenter of the paper. The winners of this year's awards are "Variable-length coding with feedback in the non-asymptotic regime," by Yury Polyanskiy with H. Vincent Poor and Sergio Verdu, "On Reconstructing a Sequence from its Subsequence Compositions," by Jayadev Acharya with Hirakendu Das, Olgica Milenkovic, Alon Orlitsky, Shengjun Pan, "On the deletion channel with small deletion probability," by Yashodhan Kanoria with Andrea Montanari, "Codes in Permutations and Error Correction for Rank Modulation," by Arya Mazumdar with Alexander Barg and "Universal Hypothesis Testing in the Learning-Limited Regime," by Benjamin Kelly with Thitidej Tularak, Aaron Wagner and Pramod Viswanath.

The Historian's Column

Often, the volunteers, who end up chairing our Symposia or governing the Society, start early in more “humble” roles, like chairs for local arrangements, publicity, finances, etc. These are all important, useful, and educational positions that provide a taste of managerial responsibilities. Not everyone is inclined to undertake such roles. Those who do are attracted by the social “urge” to serve the community and interact with (and learn from) their colleagues. And they can have some real fun!

As I am currently deeply engaged with the organization of the 2011 ISIT in St. Petersburg, I reminisced about my first involvement with an ISIT, which was as Treasurer of the 1979 Symposium in Grignano, Italy, which is a small village near Trieste in Northeastern Italy under the shadow of the (then called Yugoslavian and now Croatian) Alps. I was lured to this position by my, then, department chair (none other than Lee Davisson) who was also the ISIT co-chair. I was naturally qualified, being at the time Society Treasurer as well.

Thus, a beautiful adventure began. The other co-chair of the Symposium was Giuseppe (Pino) Longo, who has long given up Information Theory and become a prominent novel writer, radio commentator, and all-manner busybody of local intellectual life in Northern Italy. He is a wonderful (and colorful) individual and a good friend of both Lee and myself.

As Symposium treasurer I had the responsibility of putting the budget together and stopped twice (on my way to Greece) in Grignano to check things out and estimate costs. The setting of the village is beautiful right on the Adriatic sea. The hotel was modest by today's standards and I observed that the size of the bathroom soaps was minuscule (a fact that proved to be a major source of complaints during the Symposium). The proximity to the Iron Curtain (or, more accurately, the porous “Aluminum” curtain between Italy and, then, Yugoslavia) made it a rather lonely and quiet place. Neighboring Trieste, however, was (and is) a vibrant and picturesque town only 9 kilometers to the North. It is a cultural and historic hub for the region, replete with attractions of all sorts, but especially in the culinary area.

One of my visits was in February of 1979 just as the June dates of the Symposium were looming closer. One evening, Pino took me to a “joint” (rather than a restaurant) that anticipated the future waves of “fusion” cuisine. It had injected Italian flare into the Austro-Hungarian heritage. There were steaming pots in which Veal and Pork were being boiled. Moisture was lining the show windows and the plate included a cornucopia of tender cuts and bones, sizzling pieces of redolent meat falling off the bones, and mustard sauces that blended perfectly with the local Friuli wines. The warmth of the atmosphere and the camaraderie amongst the patrons was a source of good cheer for all that made everyone just linger, chat, and sip into the evening hours of the cold day. Before calling it off, we had a “shot” of Averna, that unique bitter Italian “digestif”.

But there was another experience that toppled that. At that time it was really difficult to find good espresso coffee outside Italy. The Starbuck generation may be offended but the “Lattes” and the “Frappuccinos” of the popular chain are to Italian coffee products (especially of that era) what formica tabletops are to fine mahogany. So I was confessing to Pino my infatuation with the beverage

Anthony Ephremides



that Italians describe as “Nero comme il Diavolo, Caldo comme l’Inferno, Dolce comme l’Amore” (translated as “Black like the Devil, Hot like Hell, and Sweet like Love”). He told me in no uncertain terms that the “real McCoy” was to be found in a particular café in downtown Trieste and gave me loose directions to it. The next day I was on my way to Trieste on a mission. I arrived at the central square and tried to follow Pino’s instructions. I was lost quickly in a maze of narrow streets and alleys. All of a sudden there was a “whiff” in the air that carried the unmistakable imprint of intense coffee aroma. It faded away as suddenly as it had arrived. And then, there it was again. As the wind gusted from around the corner, the smell would come in strong. So, I started chasing that smell pretty much the same way a hound follows the scent of the fox. The smell started becoming stronger and more frequent as I was snorting my way through the alleys. Coffee’s strong smell always promises a devastating flavor that it rarely delivers. So, it adds to the desire to sample and see whether that warm nose of roasted dark hues in the air would recreate the sensation on the palate. I kept coming closer until ... there it was. A crowded little bar with people standing at the counter and swallowing the black nectar in a single gulp and then exiting into the chilled air outside. In Italy everyone drinks their coffee at the bar. As they say “sit at the table and your finances go unstable; stand by the bar and your money goes far”! I ordered a “doppio con panna”, that is, an industrial strength cup of syrupy liquid with a dollop of heavy whipped cream. After an intoxicating couple of seconds of untold pleasure, it was over. Yet, the flavor lingered on the taste buds for almost half an hour. That residual sensation was the pay-off from the rare encounter with the best of arabicas.

But ... back to reality. I was there as the treasurer and had business to attend to in Grignano. We went over the menus and the options with the event manager at the hotel and calculated the costs. In those days, convention food, especially in Italy, did not have to be rubber chicken with green beans and rice. Those who attended the 1979 event must remember that the banquet and the overall food offerings (including the coffee breaks) were of unparalleled quality.

The symposium was a great success. The Shannon Lecturer was Jacob Wolfowitz and there were for the first time papers of “networking” flavor presented at an ISIT. There are always unexpected events. In Grignano’s case one of the unexpected events was the non-delivery of ... the expected! In those days there were no CD’s, USB’s or electronic mail. So, several hundred copies of the published book of abstracts had to be delivered in time for distribution to the participants at registration. Well, they were stuck at the Malpensa airport in Milan about 300 km away due to one of the strikes by some workers union (an almost daily event in Italy then).

The remedy was a quick (and expensive) decision by Lee (with my concurrence regarding affordability) to dispatch a taxi to Milan to pick up the booklets from customs and bring them to Grignano the same day.

Mulling over these memories, I realized that these “lowly” support activities can be a source of great fun.

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Seating Arrangements

Solomon W. Golomb



Suppose we have a circular table with $n + 1$ equally spaced seats, and we have $n + 1$ people, conveniently labeled $0, 1, 2, \dots, n$, and suppose $n \geq 2$.

In n consecutive rounds of seating, each of the people will have n neighbors on their right, and n neighbors on their left. We will call a seating arrangement “perfect” if it seats $n + 1$ people in n rounds in such a way that each person has every other person on their right exactly once, and on their left exactly once.

Here is an example of a *perfect* seating arrangement with 7 people in 6 rounds. Each row is a round, and is to be considered cyclically. For convenience, I have placed “person 0” at the left end of each row (so cyclically, also at the right end) and the other n people are permuted in a different way in each round.

0	1	2	3	4	5	6
0	2	4	1	6	3	5
0	3	1	5	2	6	4
0	4	6	2	5	1	3
0	5	3	6	1	4	2
0	6	5	4	3	2	1

Note that, ignoring the “all-zeroes” column at the left, what remains is a 6×6 Latin square (in this example).

Note also, in this example, the bottom three rows (ignoring the 0's) are the left-right mirror images of the top three rows (in reverse order). Hence, if we used only the top three rows (including the 0's), we could seat the seven people in only 3 rounds in such a way that every person has every other person as a neighbor (either to the left or to the right) exactly once. When n is even, and we can seat $n + 1$ people in $n/2$ rounds so that each person has every other person as a neighbor (either left or right) exactly once, we call such a seating arrangement *ideal*.

Now here are your questions.

- 1) For what values of $n \geq 2$ do *perfect* seating arrangements for $n + 1$ people exist?
- 2) In particular, is there a *perfect* seating arrangement for 8 people ($n = 7$)?
- 3) When the n rows are listed, as in the above example, for a *perfect* seating with $n + 1$ people, and we ignore the “all zeroes” column, is the $n \times n$ array that remains always a Latin square? (In a Latin square, the columns as well as the rows must be permutations of the numbers $1, 2, 3, \dots, n$.)
- 4) Show that an *ideal* seating arrangement, with $n + 1$ people in $n/2$ rounds, can always be found if $n + 1$ is prime, $n \geq 2$.
- 5) Can there ever be an *ideal* seating arrangement, for $n + 1$ people in $n/2$ round, if $n + 1$ is *not* prime?
- 6) In particular, does an *ideal* seating arrangement with 9 people exist?
- 7) For a *perfect* seating arrangement, with $n + 1 = 7$ people, how many *perfect* seating arrangements (by completing the table

0	1	2	3	4	5	6
0	2					
0	3					
0	4					
0	5					
0	6					

for the six rounds of seatings) exist?

8) For a *perfect* seating arrangement with $n + 1 = 8$ people, how many *perfect* seating arrangements (by completing the table

0	1	2	3	4	5	6	7
0	2						
0	3						
0	4						
0	5						
0	6						
0	7						

for seven rounds of seatings) exist (if any!)?

Note that *existence* requires only an example, while non-existence requires either a proof or an exhaustive search. (Answering problems 7. and 8. will almost certainly require computer searches.)

Infinite Sequences With Bounded Overlap Solutions

Solomon W. Golomb



- 1) Here is one uncountably infinite subfamily G of the family F of all infinite subsequences of the positive integers, such that for every pair of sequences S_1 and S_2 in G , the intersection $S_1 \cap S_2$ is finite.

For each real number $x \in [1/2, 1)$, take the infinite binary expansion of x : $x = 0.1a_2a_3a_4 \dots$ where each a_i : $i > 1$, is either 0 or 1. Associate with x the sequence of positive integers (in ordinary binary notation) $1, 1a_2, 1a_2a_3, 1a_2a_3a_4, \dots$. If $y \in [1/2, 1)$ with $y \neq x$ and $y = 0.1b_2b_3b_4 \dots$, then the sequence for y : $1, 1b_2, 1b_2b_3, 1b_2b_3b_4, \dots$, cannot agree with the sequence for x from the first k where $a_k \neq b_k$ onward; so the two sequences will agree on only their first $k - 1$ terms, a finite number. (It is well-known that the set of points on $[1/2, 1)$ is uncountably infinite. The fact that certain rational values $r \in [1/2, 1)$ have *two* binary expansions, e.g. $3/4 = 0.110000 \dots = 0.101111 \dots$, merely *increases* the number of sequences in G , by a countable infinity of additional examples.)

- 2) Examples of sequence pairs $A = \{a_i\}$ and $B = \{b_i\}$ for which $C_{AB}(\tau)$ is finite for all τ , $-\infty < \tau < +\infty$, are given in the solutions below to Problem 3 and Problem 4.
- 3) With $f_1 = f_2 = 1, f_{k+1} = f_k + f_{k-1}$ for all $k \geq 2$ (the Fibonacci sequence) let $A = \{f_{2n}\}$ for all $n \geq 1$, and $B = \{f_{2n-1}\}$ for all $n \geq 1$, the even and the odd Fibonacci terms, respectively. The "difference set" for A , all integers $f_{2b} - f_{2a}$ for $b > a > 0$, namely $\{2, 5, 7, 13, 18, 20, 34, 47, 52, 54, \dots\}$, is disjoint from the "difference set" for B , all integers $f_{2b-1} - f_{2a-1}$ for $b > a > 1$, namely $\{1, 3, 4, 8, 11, 12, 21, 29, 32, 33, \dots\}$. Hence $C_{AB}(\tau) \leq 1$ for all τ , $-\infty < \tau < +\infty$.
- 4) Let $A = \{a_j\}$ for all $j \geq 1$ be defined by $a_j = ((2j)!)^3$, and let $P = \{p_j\} = \{2, 3, 5, 7, 11, 13, \dots\}$ be the sequence of the prime numbers. For any integer τ , $-\infty < \tau < +\infty$, the sequence $A + \tau$ cannot contain more than $|\tau|$ primes; so $C_{AP}(\tau) \leq |\tau|$ for all $\tau \in \mathbb{Z}$. Specifically: i) at $\tau = 0$, A contains no primes; ii) at $\tau = +1$, since $x^3 + 1 = (x + 1)(x^2 - x + 1)$, $A + 1$ contains no primes; iii) at $\tau = -1$, since $x^3 - 1 = (x - 1)(x^2 + x + 1)$, $A - 1$ contains only the one prime $2^3 - 1 = 7$; and iv) for $|\tau| > 1$, $A + \tau = ((2j)!)^3 + \tau$ is divisible by $|\tau|$, and hence composite, for all $j \geq |\tau|$.
- 5) If a sequence A exists for which $C_{AP}(\tau) < K$ for all $\tau \in \mathbb{Z}$, where P is the set of prime numbers, and K is any finite bound (however large, but independent of τ), then the famous "prime k -tuples conjecture" would be false. Finding such a sequence A , or proving that no such sequence A can exist, would be a major accomplishment.

Notes, References and Acknowledgements

- 1) Questions 4 and 5 were posed by me in Problem 10208, *American Mathematical Monthly*, vol. 99, 1992, p. 266. I also supplied the solution given here to Question 4, and the observation about the "prime k -tuples conjecture" (which asserts that the set of k integers $n + 0, n + a_2, n + a_3, \dots, n + a_k$ will be simultaneously prime for infinitely many values of n , provided that $a_1 = 0, a_2, a_3, \dots, a_k$ do not fill up a complete residue system modulo p for any prime p).
- 2) The Fibonacci example in the solution to Problem 3 was one of several examples that resulted from a discussion with John H. Conway and Neil J.A. Sloane at Gathering for Gardner 9, Atlanta, GA, March, 2010.
- 3) The possibility that there could be a sequence A satisfying the requirement in Question 5 is termed "Golomb's Conjecture" in *The Little Book of Bigger Primes, Second Edition*, by P. Ribenboim, Springer-Verlag, New York, 2004, pp. 202-203.
- 4) My formulation of these problems in terms of crosscorrelation was inspired by a conversation with Peter Sarnak in January, 2010.

IEEE Information Theory Society Board of Governors Meeting

January 31, 2010 La Jolla, CA

Aria Nosratinia

Attendees: Daniel Costello, David Forney, Rolf Johannesson, Frank Kschischang, Aria Nosratinia, Abbas El Gamal, Martin Bossert, Muriel Médard, Kenneth Zeger, Michelle Effros, Li Peng, Gerhard Kramer, Nihar Jindal, Alexander Barg, Andrea Goldsmith, Hans-Andrea Loeliger, Paul Siegel, Bruce Hajek, Syed Jafar, Giuseppe Caire, Christina Fragouli, Emina Soljanin, Elza Erkip, Alexander Vardy, Anand Sarwate.

The meeting was called to order at 13:30 hours by the Society President Frank Kschischang, who greeted the members of the board.

- 1) The agenda was approved by consent, including the minutes of the previous BoG meeting in Taormina.
- 2) The President presented his report, with the following outline: The society is in good shape. Our system with its shift-register of officers works well and gives us institutional memory. The financial health of the society is good and improving. Our journal is strong. Conferences and workshops are strong. We lead IEEE in services provided for our student members. The online committee has done a fabulous job, and our web page is arguably superior to that of any other Society in the IEEE, although it is not utilized to the fullest extent. In the President's column (in the Society Newsletter), I mention that our society is unique in its collegiality. A total of 88 volunteers either serve as associate editors or on committees. The President thanked all these volunteers.

What should we focus on this year? Our Transactions, although technically strong, is not without problems. At the last TAB meeting, a prominent person from the Signal Processing Society commented that he had negative experiences in submitting papers to our Transactions, and as a result discourages his students from submitting to our Transactions. That is a serious comment that we should try to address. The sub-to-pub time increased last year, despite all our efforts, from 92 weeks to 99 weeks. Without a major cultural shift in our Society, this cannot be fixed, and we may lose excellent papers as a result. Andrea Goldsmith started an initiative during her presidency to address the sub-to-pub time, and the current President will continue to work on this issue. Our planned transition to ScholarOne is one step in the right direction. This is only an administrative change, however, and may not by itself be enough to solve the problem. We will try to focus the attention of the Society on this issue and address it in creative ways.

The other issue to focus in the coming year is to increase the usefulness of our online web pages.

The current President thanked the previous President, Andrea Goldsmith, for her services to the Society.

- 3) The Treasurer's report was presented by the IT Treasurer, Nihar Jindal. The finances of the society are improving. The major updates since the last BoG meeting are: investment

returns \$538K, net 2009 operating surplus \$100K, reserves at end of 2009 \$2.3M. The Society reserves-to-expenses ratio is 1.3, well above the IEEE minimum of 0.5. The IEEE has reinstated the option of allowing Societies to spend up to 50% of their previous year's surplus, which increases our flexibility.

Print subscriptions are trending downwards. Our two sources of print subscriptions are: institutions that subscribe only to print at the non-member rate of \$1,075, yielding \$200K/year, and institutions that subscribe to a package including print with IEEEExplore. Many of the latter institutions are cutting print subscriptions.

Another concern is conference publication revenue. Changes in the IEEE formula for revenue-sharing will begin to be implemented in 2010, and we expect to lose \$120K per year.

Possible new revenue sources for the Society include elimination of the subsidy for members who receive print copies of the Transactions. The annual cost is \$100, but members are charged only \$45. A formal proposal for eliminating this subsidy will be presented at the next BoG meeting. A possible source of revenue is to introduce tutorial papers and magazine-like articles in the Transactions, but the financial model would need to be investigated. Finally, another potential source of greater revenue is conferences.

In summary: after large losses in 2008, investment gains in 2009 have improved our reserves, but long-term concerns still exist, especially for publication revenue.

- 4) The Second Vice President, Muriel Médard, presented the report of the Membership and Chapters Committee (MCC). Current members of the committee are Sae-Young Chung, Max Costa, Michelle Effros, Uri Erez, Stephen Hanly, Gerhard Kramer, Amin Shokrollahi, Rüdiger Urbanke, Han Vinck, Raymond Yeung, Lizhong Zheng, as well as Emina Soljanin.

The formation of the IEEE Tainan Section Information Theory Society Chapter was announced.

The IT Society sponsors the Padovani Lecture in the Summer School, and also a separate Distinguished Lecturer program, which is just getting under way. The first Padovani Lecturer was Abbas El Gamal. The next Padovani Lecturer will be Jack Wolf. The donation by Robert Padovani of \$10K will eventually run out; if we think this is a worthwhile endeavor, then we might want to raise funds for it for the long run. The formal description of the Padovani Lecture was presented to the BoG (available in the MCC report).

The current set of Distinguished Lecturers consists of Amin Shokrollahi, Alon Orlitsky, Sergio Verdú, Michael Gastpar, and Andrea Goldsmith. Five more will be chosen each year.

Each Distinguished Lecturer will serve for two years, so that in steady state there will always be 10 lecturers.

Chapters desiring to invite a Distinguished Lecturer must submit a proposal indicating the benefit to the chapter. The proposals will be evaluated by the MCC, and if approved will be forwarded to the Distinguished Lecturer. The value of the program will be assessed via feedback from both the chapters and the Distinguished Lecturer. The chapters will be asked to post the slides on the Society web site, and if possible, the video of the lecture as well.

Regarding membership development: in the last few years, a half-year free membership has been offered with ISIT registration. 283 registrants in 2008 and 169 in 2009 have taken advantage of this initiative. The implementation of this initiative has not always been easy. An alternative approach would be to offer a different price for IEEE members who are IT members than for IEEE members who are not Society members. There were comments indicating that this is already a policy of the Society, but it has not been widely implemented. It was suggested that perhaps we could do both, because the two initiatives serve different purposes: one of them is a recruitment tool, and the other is a member benefit. It was suggested that we could set the price differential at exactly the value of the half-year membership. Another option would be to make the Tuesday luncheon free for IT members but not for general IEEE members, but it was concluded that may be too complicated to administer. IEEE is considering the possibility of giving one free Society membership with IEEE membership; we need to track this proposal. The President moved that we continue the first approach and start the second one, and evaluate the results of both. The motion carried unanimously.

- 5) The Outreach Committee report was presented by Muriel Médard for Todd Coleman. Last year the society had a robust outreach program. The mentor/mentee program was expanded, with a breakfast at ISIT. Another initiative is Women in the Information Theory Society (WithITS). Todd Coleman has agreed to lead the administration of the mentorship program, and Christina Fragouli to lead the WithITS. Growth directions for these initiatives were discussed. Andrea Goldsmith asked if we want to make this a standing committee. David Forney mentioned that the Bylaws will come up for discussion in the Allerton meeting and that would be a good time to discuss whether this should become a standing committee. The BoG thanked Muriel Médard for her efforts on the Outreach Committee.
- 6) The Nomination and Appointments Committee (NAC) report was presented by the Senior Past President, David Forney. The majority of the committee's work is done in January, and David Forney praised the hard work of the committee members. There are a mix of ways of staffing our committees. Four committees must be staffed in January: the Fellows, Shannon, Wyner and Awards Committees. It is desirable that every BoG member has a committee assignment or other substantial task to do. The Past President, Andrea Goldsmith, took a survey of BoG members, and many BoG members have been assigned to committees on this basis. It was recommended that this process continue.

The NAC has received requests for the members of the Fellow Committee to be announced sooner, because the deadline for Fellow nominations and recommendations is March 1, and Fellows Committee members cannot act as nominators or references. The Fellows Committee for 2010 will be: Michelle Effros, Michael Honig, Hideki Imai, Rolf Johannesson, Marcelo Weinberger, and Frans Willems (chair).

The Shannon Award Committee consists of: Frank Kschischang (chair), Giuseppe Caire (1VP), Muriel Médard (2VP), Imre Csiszàr (continuing), Abbas El Gamal (new), Robert Gallager (new), and Robert Gray (continuing). The Bylaws say that this committee must include the President, 1VP and 2VP *ex-officio*, one past Editor-in-Chief, and three previous winners of the Shannon Award.

The Wyner Award Committee consists of: Frank Kschischang (chair), Giuseppe Caire (1VP) Andrea Goldsmith (JPP), Dick Blahut (new), and Jack Wolf (new). The NAC recommended that the Bylaws be changed to require only two officers (President and Junior Past President) and two past Wyner Award winners.

The Awards Committee will consist of: Giuseppe Caire (chair), Muriel Médard (2VP), Alexander Barg (new), Max Costa (new), Elza Erkip (new), Hans-Andrea Loeliger (new), Ueli Maurer (continuing), Li Ping (new), Hirosuke Yamamoto (new), En-hui Yang (continuing), and Ram Zamir (continuing). The NAC recommended that the Bylaws be changed to require two BoG members (in addition to the two officers) on the Awards Committee.

The BoG unanimously approved all of the NAC recommendations.

- 7) The Fellows Committee report was presented by Daniel Costello. Last year 14 nominations were received, and 7 people were ultimately elected to the rank of Fellow. This success ratio was higher than the historical norm of around 40%. This year, the IEEE has instituted an all-electronic nomination format. There is an option for any Fellow to be asked to provide a comment or evaluation for a candidate.
- 8) The Online Committee report was presented by Anand Sarwate for Nick Laneman. The web site is working well. The next objective is to increase the content and utilize the web site to its full potential. Work is in progress to put compressed videos of the ISIT Shannon Lectures and plenary lectures on the web site. Another goal is to integrate the conference web sites with the society web site. Suggestions were made to incorporate ISIT tutorials into the web page, and also better to integrate the material that is published in our Newsletter and highlight it on our web page. Another suggestion was to link out-of-print or hard-to-find information theory texts to the web site.

The BoG thanked the Online Committee for a great job done during the last year.

- 9) The Student Committee report was presented by Gerhard Kramer. He gave an update on the Third Summer School on Information Theory, August 5–8, 2010. Applications are due

April 15, registrations June 1. The Summer School will have a new format, with six two-hour lectures during the first three days. The school has been registered with IEEE as a conference, with ITSoc as the sponsor. Already \$10K has been approved from the Society to be provided to the Summer School in 2010. The dorm contract has been submitted to the IEEE for review. Five potential instructors have been contacted. Jack Wolf will be the Padovani Lecturer. There will be efforts to encourage participation from local residents and from Mexico. With regard to fundraising: \$58K was raised last year, including \$10K from ITSoc, \$10K from NSF, and the remaining from other sources. The committee requests that the society provide an additional \$10K this year to reach the same level as last year (\$20K). This request was approved by the BoG unanimously.

- 10) The Publications Committee report was represented by Frank Kschischang for the Editor-in-Chief, Ezio Biglieri. There was no report. A motion was made to appoint James Massey to replace John Anderson as the Book Review Editor.

There was a report by Alex Grant on migration to ScholarOne. The ScholarOne web site has gone active and is being tested by Alex Grant, Adriaan van Wijngaarden, Ezio Biglieri and Helmut Bölcskei. Helmut Bölcskei is the designate for the next Editor-in-Chief, to be formally approved at the BoG Annual Meeting. It is expected that ScholarOne will streamline the work of the Associate Editors. In the officers meeting, held a day earlier, the possibility of hiring a staff person was raised, but this will be up to the incoming Editor-in-Chief. Helmut Bölcskei is in the process of putting together a manifesto with regard to the outstanding issues that need to be addressed with our Transactions.

- 11) The Conference Committee report was presented by the chair, Bruce Hajek. For ISIT Seoul, a surplus of about \$64K is expected. For ISIT 2010 (Austin) everything seems to be on track. For ISIT 2011 (St Petersburg), the date will be the first week of August 2011. The web site is up, and the final budget is in preparation. It was mentioned that at the same time as ISIT 2010, the SIAM discrete math biannual meeting will be taking place in Austin, and it was suggested to explore an agreement with SIAM for mutual admission of the attendees of the two conferences.

ISIT 2012 Cambridge/MIT is on track. An update will be given at the next BoG meeting.

ISIT 2013, to be held in Turkey, has been preliminarily approved. The loan requested by ISIT 2013 is 125,000 euros. Questions were asked about the schedule of the loan. A motion for the location of ISIT 2013 (Turkey) and for granting the loan for ISIT 2013 were approved by the BoG.

Interest has been expressed for ISIT 2014 in the San Francisco Bay area and Hawaii. For 2015, interest has been expressed for China or Hong Kong by Raymond Yeung and Pingzhi Fan.

ITW Volos 2009 anticipates a \$2.5K surplus. The Conference Committee is awaiting the final report from the Taormina and Cairo ITWs. In Cairo there were 207 participants. ITW Cairo had approximately \$10K surplus, and Hesham El Gamal has

suggested to use it for a winter school of information theory in Cairo. However, the BoG encouraged ITW Cairo to close the books and do the winter school proposal separately.

For ITW 2010 Dublin, the hotel contract has been finalized. A motion was made to approve the budget for ITW Dublin, and the motion was carried unanimously.

Max Costa made a presentation for the proposed ITW at Paraty, Brazil. The topics include coding, cryptography, compressed sensing, and related areas. The local attractions as well as the budget were presented. A BoG member made a comparison with the ITW 2006 in Punta del Este, which was also remote and very successful, but in contrast it was much cheaper. It was mentioned that Punta del Este is much more accessible than Paraty, and there was concern about the accessibility of the location. After extensive discussions, a motion for the workshop and its budget were approved by majority vote of BoG.

A proposal was made for technical co-sponsorship of Allerton 2010 (jointly with the IEEE Control Society). This proposal was approved by the BoG. A proposal was made for technical co-sponsorship of SIBIRCON 2010. A discussion ensued about the quality of the conference, its acceptance rates, and the relationship of the conference to the core area of ITSoc. The motion for technical sponsorship of SIBIRCON 2010 did not pass.

The Conference Committee presented recommendations regarding the purpose and accessibility of workshops. In particular, workshop proposers and organizers are encouraged to put together workshops that complement, not mimic, the ISITs. It was mentioned that the Society does not have enough workshops in no-frills, accessible venues that are inexpensive enough that allow for good student participation. David Forney commented that in the past, it was a tradition that there were two types of workshops per year: one of them of the outreach type, and one of them more accessible. In the recent past, however, most of the workshops have been of the exotic type. Various issues related to organizing workshops were extensively discussed.

- 12) Muriel Médard commented on behalf of herself and Dick Blahut that we need to do more to make IT and its contribution to daily life more visible to the general population, as well as to key decision makers. It was suggested that from some angles our society is perceived as unfriendly and unapproachable. On the other hand, many of our initiatives, including the Summer School, are designed to bring people into our area.
- 13) David Forney suggested to put in place a liaison to the Signal Processing Society. The President undertook to consider this suggestion and, after discussion with the officers, to recommend a person for an SPS liaison.
- 14) Muriel Médard mentioned the Green Touch initiative (greentouch.org), which could be of interest to our general membership.
- 15) The meeting was adjourned at 16:45 hours.

Event Report: Broadcast Channel Summit

The Chinese University of Hong Kong, March 7–14

Recently there has been a spurt of activity on the discrete memoryless broadcast channel problem, notable successes being strictly better outer bounds; a new cardinality bounding technique that makes the evaluation of Marton's inner bound feasible; the demonstration of a gap between the best known inner and outer bounds for the binary skew-symmetric broadcast channel; use of indirect decoding to strictly improve achievable regions for three or more receivers; and the determination of the capacity region for certain classes of BISO channels. A small workshop, with generous support from the Institute of Network Coding (<http://www.inc.cuhk.edu.hk>) and the Institute of Theoretical Computer Science and Communication (<http://www.itcsc.cuhk.edu.hk>) was arranged to bring together some researchers who have been very active in this area recently. Prof. Venkat Anantharam (UC Berkeley), Amin Aminzadeh Gohari (UC Berkeley), Prof. Abbas El Gamal (Stanford), and Prof. Young-Han Kim (UCSD) joined locals Prof. Chandra Nair, Vincent Wang, and Yanlin Geng for this week-long workshop at The Chinese University of Hong Kong.

The idea was to make sense of these recent developments in the discrete memoryless broadcast channel problem and to share insights and intuition. The air was full of suspense: can one improve on Marton's inner bound or is this the true capacity region?; can one establish optimality of the current outer bound or can we strictly improve it? None of these fun questions was resolved during the workshop, thus not depriving others of this wonderful 'pursuit of happiness', but the participants went away better equipped in their attempts to reach the summit. The technical discussions centered around the key developments that have taken place in the preceding three years. (For those interested, a monograph on these developments is under preparation and may be forthcoming in the coming months.) For the larger audience in the universities in

Hong Kong, lectures provided by the participants in the first two days outlined most of the classical and recent results. (The videos and slides of the lectures can be downloaded at <http://www.inc.cuhk.edu.hk/event.html>)



A. Gohari, V. Anantharam, R. Yeung, A. El Gamal, P. Moulin at the Repulse Bay beach



Y-H Kim and C. Nair on Dragon's Back trail

A hike along Dragon's Back trail that offered glorious views of the eastern coastline of Hong Kong Island, trips to Victoria Peak and Stanley Market, and savoring some of the local culinary delights provided welcome respite during the week-long event.

First IEEE African Winter School on Information Theory and Communications

Mopani Camp, Kruger National Park, South Africa, 1-4 June 2010

Reolyn Heymann

The first IEEE African Winter School on Information Theory and Communications was held from 1–4 June 2010, at Mopani Camp in the Kruger National Park, South Africa. The winter school was initiated by Han Vinck from the University of Duisburg-Essen, who also established the European Winter School on Coding and Information Theory. The Telecommunications Research Group from the University of Johannesburg hosted the event with Hendrik Ferreira as general chair and Han Vinck as technical chair.

The winter school started off with a welcoming function on the deck of the Mopani conference centre and attendees were entertained by local traditional tribal dancers. The technical programme was scheduled in such a way as to allow attendees to participate in morning, sunset and evening game drives. The banquet was in the form of a boma braai. Tables were set outside and participants could enjoy each others' company under the starry night.

Since the winter school included participants from both the fields of Information Theory and Communications, it was important to have tutorials on a wide range of topics. There were five invited tutorial sessions, presented by Vijay Barghava from the University of British Columbia (Multigigabit Wireless Multimedia Communications: Future and Core Technologies), Claude Carlet from the Universit Paris 8 (Highly Nonlinear Filter Boolean Functions with High Algebraic Immunity for Stream Ciphers), Amin Shokrollahi from EPFL (The Development of Raptor Codes), Han Vinck from the University of Duisburg-Essen (Concepts in Information Theory and Coding Techniques) and Jos Weber from the Delft University of Technology (Energy-Efficient Communications via Network Coding). A special session was dedicated to advising doctoral

students on how to start and successfully manage a career as an academic. This session was presented by Willem Clarke from the University of Johannesburg.

Post-graduate students also had the opportunity to present their ongoing research during the regular paper presentations, and received valuable feedback from the experienced and distinguished researchers. The winter school was attended by 45 participants, of which 24 were postgraduate students. Participants represented 15 universities and 9 different countries, including the African countries of South Africa, Egypt, Tanzania, Nigeria, Zambia and Swaziland.

Immediately after the winter school, the organisers also hosted the IEEE Region 8 Chapter Chair Conference and Leadership Joint Workshop.

I would like to thank my colleagues for all their help and dedication while organising the event: Hendrik Ferreira, Han Vinck, Theo Swart, Monya Badenhorst and Khmaies Ouahada. On behalf of the organising committee and all the attendees, a special word of gratitude towards the IEEE Information Theory Society, the University of Johannesburg, the Shannon Foundation, the IEEE Region 8 committee and the IEEE Region 8 Chapter Coordination Subcommittee for their financial support.

For more information about the winter school, please visit our website: www.awsitc.info. The lecture slides are available, as well as the proceedings. The next winter school is planned to be held in Cairo and will be hosted by the Nile University.



2010 International Symposium on Network Coding (NetCod 2010)

The Hart House, University of Toronto, Toronto, Canada, June 9–11, 2010

Since 2005, NetCod has been a very successful series of workshops providing an International forum for the presentation and discussion of new research and ideas on network coding, ranging from theoretical results to practical applications. Network coding research has expanded its scope, and continues to be an active research field in the information theory and networking communities. It has been the tradition of past NetCod workshops to represent inter-disciplinary and focused research, with an emphasis on innovation.

The Technical Program of NetCod 2010 includes 21 technical papers in its Proceedings, which have been selected by an expert Technical Program Committee from a total of 38 paper submissions. It spans eight technical sessions from June 9 to June 11, and covers a wide range of research topics. In addition to more traditional network coding topics such as network code construction, the scope of NetCod 2010 has included high-quality work in some recently active research directions, including security issues involving network coding, as well as the application of network coding in wireless networks, peer-to-peer networks, and distributed storage systems. As a result, some of the technical sessions reflect these research directions, such as “Security with Network Coding,” “Network Coding in Practical Networks,” and “Applications of Network Coding.” NetCod 2010 sessions have covered the complete spectrum of network coding research, from theory to practice.

Much effort by the Technical Program Committee has gone into putting together the high-quality technical program that we included in NetCod 2010. The quality and quantity of submissions were both strong. The program committee has had a difficult task to select the papers among many high-quality deserving paper submissions. Similar to NetCod workshops in previous years, the reviewing process has been completed within a very short period of time, in order to include the latest results in the area of network coding research.

NetCod 2010 has invited three plenary keynote speakers, Professor Babak Hassibi from California Institute of Technology, Professor Christina Fragouli from EPFL, and Professor Alex Dimakis from University of Southern California, to offer three plenary talks, one in each day of the conference. The topics of their talks were as follows:

During these plenary talks, the keynote speakers have enlighten the audience with their own perspectives on the future of network coding research.

48 researchers from both academia and industry have attended for the event, including the chairs and keynote speakers.

The technical sessions of the conference were very well attended. There were a great number of questions being asked during the plenary technical sessions, and a great deal of discussions in between sessions and after the sessions conclude



June 9: Professor Babak Hassibi — “Optimal Network Coding for Small Alphabet Sizes”



June 10: Professor Christina Fragouli — “Network Coding: Beyond Throughput Benefits”



June 11: Professor Alex Dimakis — “Network Coding for Distributed Storage”

every day. All the attendees have enjoyed the quality of the keynote talks and technical sessions, as well as the live discussions in the conference.

In summary, building on the successes of previous NetCod workshops, NetCod 2010, technically sponsored by the IEEE Information Theory Society, and financially sponsored by MITACS Inc., has successfully continued its tradition to bring together researchers and practitioners working in this area to discuss recent and innovative results, and to identify future directions and challenges in developing breakthrough theoretical results and real-world practical applications with network coding.

*Baochun Li and Frank Kschischang,
NetCod 2010 Co-chairs
Department of Electrical and Computer Engineering
University of Toronto
June 9–11, 2010*



Sponsors



CTW 2011

The workshop will be held near the beautiful beach at Sitges, Catalonia, Spain, the city well known for its Film Festival and Carnival. As always, the workshop will be single track with five technical sessions, three plenary speakers, five panel discussions, and two open poster sessions. The workshop will be followed by the well celebrated The Night of Saint John the Baptist in Barcelona!

<http://www.ieee-ctw.org>

2011 IEEE INTERNATIONAL SYMPOSIUM ON INFORMATION THEORY

CALL FOR PAPERS

31 JULY - 5 AUGUST, 2011. SAINT PETERSBURG, RUSSIA



The 2011 International Symposium on Information Theory will take place July 31 - August 5, in Saint Petersburg, Russia, the Northern capital of the Russian Federation. Previously unpublished contributions from a broad range of topics in information theory are solicited, including (but not limited to) the following areas:



Coding theory and practice
Compression
Detection and estimation
Network communication theory
Pattern recognition and learning
Sequences and complexity
Signal processing

Communication theory
Cryptography and data security
Information theory and statistics
Multiple terminal information theory
Quantum information theory
Shannon theory
Source coding

Researchers working in emerging fields of information theory or on novel applications of information theory are especially encouraged to submit original findings. Submitted papers should be of sufficient depth for review by experts in the field. Final papers will be limited to 5 pages in standard IEEE conference format. The paper submission deadline is February 10, 2011, at midnight, Eastern Time (New York, USA). The deadline is firm and no extensions will be granted. Notification of acceptance by May 1, 2011. Detailed information on paper submission, technical program, tutorials, travel, social programs, and travel grants will be announced on the ISIT 2011 website: www.isit2011.org.



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E. Viterbo
P. Vontobel
T. Weissman
R. Yeung
G. Zémor
Q. Zhao
L. Zheng

Conference Calendar

DATE	CONFERENCE	LOCATION	WEB PAGE	DUE DATE
August 30– September 3, 2010	2010 IEEE Information Theory Workshop (ITW 2010)	Dublin, Ireland	http://www.shannoninstitute.ie/itw2010/	Passed
September 06–10, 2010	6th International Symposium on Turbo Codes & Iterative Information Processing	Brest, France	http://conferences.telecom-bretagne.eu/turbocodes/	Passed
September 13–14, 2010	3rd International Workshop on Multiple Access Communications	Barcelona, Spain	http://www.csit-spb.ru/macom2010.html	Passed
September 29– October 01, 2010	48th Annual Allerton Conference on Communications, Control, and Computing	Monticello, Illinois, USA	http://cslgreenhouse.csl.illinois.edu/allerton/	Passed
October 17–20, 2010	2010 International Symposium on Information Theory and its Applications and the 2010 International Symposium on Spread Spectrum Techniques and Applications (ISITA 2010 and ISSSTA 2010)	Taichung, Taiwan	http://isita2010.cm.nctu.edu.tw/	Passed
October 25–27, 2010	24th IEEE Annual Computer Communications Workshop (CCW2010)	Lake Arrowhead, CA, USA	http://committees.comsoc.org/tccc/ccw/2010/	Passed
November 7–10, 2010	The Asilomar Conference on Signals, Systems, and Computers (Asilomar 2010)	Pacific Grove, CA, USA	http://www.asilomarssc.org/	Passed
December 6–10, 2010	2010 IEEE Global Communications Conference (GLOBECOM 2010)	Miami, Florida, USA	http://www.ieee-globecom.org/	Passed
March 23-25, 2011	45th Annual Conference on Information Sciences and Systems (CISS 2011)	Baltimore, Maryland	http://ciss.jhu.edu	January 5, 2011
April 10–15, 2011	IEEE INFOCOM 2011	Shanghai, China	http://www.ieee-infocom.org/	Passed
May 9–13, 2011	WiOpt 2011	Princeton, New Jersey, USA	http://www.wiopt.org	December 23, 2010
May 14–17, 2011	2011 IEEE Vehicular Technology Conference (VTC2011-Spring)	Budapest, Hungary	http://www.ieeevtc.org/vtc2011spring/	September 30, 2010
June 5–9, 2011	IEEE International Conference on Communications (ICC 2011)	Kyoto, Japan	http://www.ieee-icc.org/	September 7, 2010
June 20–22, 2011	2011 IEEE Communication Theory Workshop	Sitges, Catalonia, Spain	http://www.ieee-ctw.org	
July 31– August 05, 2011	2011 IEEE International Symposium on Information Theory (ISIT 2011)	St Petersburg, Russia	http://www.isit2011.info	February 10, 2011
October 16–20, 2011	2011 IEEE Information Theory Workshop (ITW 2011)	Paraty, Brazil	http://www.fee.unicamp.br/pitw2011/	April 10, 2011

Major COMSOC conferences: <http://www.comsoc.org/conf/index.html>