

PATENT ASSIGNMENT

Electronic Version v1.1
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SUBMISSION TYPE:	NEW ASSIGNMENT								
NATURE OF CONVEYANCE:	ASSIGNMENT								
CONVEYING PARTY DATA									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:70%;">Name</th> <th>Execution Date</th> </tr> </thead> <tbody> <tr> <td>Kevin J. Bowers</td> <td>01/23/2008</td> </tr> <tr> <td>Ron Dror</td> <td>01/23/2008</td> </tr> <tr> <td>Martin M. Deneroff</td> <td>01/23/2008</td> </tr> </tbody> </table>		Name	Execution Date	Kevin J. Bowers	01/23/2008	Ron Dror	01/23/2008	Martin M. Deneroff	01/23/2008
Name	Execution Date								
Kevin J. Bowers	01/23/2008								
Ron Dror	01/23/2008								
Martin M. Deneroff	01/23/2008								
RECEIVING PARTY DATA									
Name:	D. E. Shaw Research LLC								
Street Address:	39th Floor, Tower 45,								
Internal Address:	120 West Forty-Fifth Street								
City:	New York								
State/Country:	NEW YORK								
Postal Code:	10036								
PROPERTY NUMBERS Total: 1									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;">Property Type</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Application Number:</td> <td>11975694</td> </tr> </tbody> </table>		Property Type	Number	Application Number:	11975694				
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Application Number:	11975694								
CORRESPONDENCE DATA									
Fax Number:	(617)500-2499								
<i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i>									
Phone:	6175002500								
Email:	chandler@ortpatent.com								
Correspondent Name:	J. Robin Rohlicek								
Address Line 1:	10 Fawcett Street								
Address Line 2:	Occhiuti Rohlicek & Tsao LLP								
Address Line 4:	Cambridge, MASSACHUSETTS 02138								
ATTORNEY DOCKET NUMBER:	30023-006001								
NAME OF SUBMITTER:	Cassie A. Chandler								
Total Attachments: 3									

CH \$40.00 11975694

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**PATENT
 REEL: 020590 FRAME: 0431**

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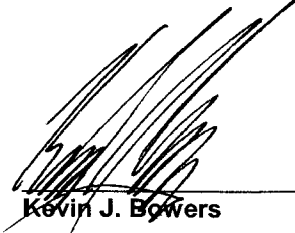
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ASSIGNMENT

For valuable consideration, we, **Kevin J. Bowers** of 3 Freeman Lane, Bridgewater, NJ 08807, **Ron Dror** of 315 W. 70th Street, Apt. 9G, New York, NY 10023, and **Martin M. Deneroff** of 24 Old Farm Road, Oakhurst, NJ 07755, , as joint inventors with **David E. Shaw** of, 39th Floor, Tower 45, 120 West Forty-Fifth Street, New York, NY 10036, hereby assign to D. E. Shaw Research, LLC, a Delaware limited liability company having a place of business at 39th Floor, Tower 45, 120 West Forty-Fifth Street, New York, NY 10036 USA, and its successors and assigns (collectively hereinafter called "the Assignee"), effective as of April 19, 2006, our entire right, title and interest throughout the world in the inventions and improvements which are subject of an application for:

United States Patent entitled **Particle Interactions**, filed April 19, 2005, and assigned U.S. Serial Number 60/672,717; United States Patent entitled **Particle Interactions**, filed August 18, 2005, and assigned U.S. Serial Number 60/709,184; United States Patent entitled **Particle Interactions**, filed January 4, 2006, and assigned U.S. Serial Number 60/756,448; Patent Cooperation Treaty application entitled **Approaches to Computation of Particle Interactions**, filed April 19, 2006, and assigned PCT Number PCT/US2006/014782; this assignment including said application, any and all United States and foreign patents, utility models, and design registrations granted for any of said inventions or improvements, and the right to claim priority based on the filing date of said applications under the International Convention for the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other treaties of like purposes; and we authorize the Assignee to apply in all countries in our name or in its own name for patents, utility models, design registrations and like rights of exclusion and for inventors' certificates for said inventions and improvements; and we agree for ourselves and our respective heirs, legal representatives and assigns, without further compensation to perform such lawful acts and to sign such further applications, assignments, Preliminary Statements and other lawful documents as the Assignee may reasonably request to effectuate fully this assignment.

Date: 1/23/2008



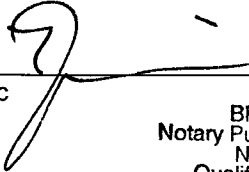
Kevin J. Bowers

STATE OF New York)
) SS.
COUNTY OF New York)

BRIAN J. LILLARD
Notary Public, State of New York
No. 01LI6137030
Qualified in Kings County
Certificate Filed in New York County
Commission Expires November 14, 2009

On January 23rd, 2008, before me, the undersigned, a notary public for the State of New York, there personally appeared **Kevin J. Bowers** personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to this Assignment, who acknowledged having executed the same in his authorized capacity and that by his signature on this Assignment, the person or the entity upon behalf of which he acted, executed this Assignment.

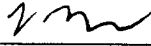
WITNESS my hand and official seal.



Notary Public

BRIAN J. LILLARD
Notary Public, State of New York
No. 01LI6137030
Qualified in Kings County
Certificate Filed in New York County
Commission Expires November 14, 2009

Date: 1-23-2008



Ron Dror

STATE OF New York)
) SS.
COUNTY OF New York)

On January 23rd, 2008, before me, the undersigned, a notary public for the State of New York, there personally appeared **Ron Dror** personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to this Assignment, who acknowledged having executed the same in his authorized capacity and that by his signature on this Assignment, the person or the entity upon behalf of which he acted, executed this Assignment.

WITNESS my hand and official seal.



Notary Public

BRIAN J. LILLARD
Notary Public, State of New York
No. 01LI6137030
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Date: 1/23/2008

Martin M. Deneroff
Martin M. Deneroff

STATE OF New York)
COUNTY OF New York) SS.

~~BRIAN J. LILLARD
Notary Public, State of New York
No. 01LI6137030
Qualified in Kings County
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On January 23rd, 2008, before me, the undersigned, a notary public for the State of New York, there personally appeared **Martin M. Deneroff** personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to this Assignment, who acknowledged having executed the same in his authorized capacity and that by his signature on this Assignment, the person or the entity upon behalf of which he acted, executed this Assignment.

WITNESS my hand and official seal.

Brian J. Lillard
Notary Public

BRIAN J. LILLARD
Notary Public, State of New York
No. 01LI6137030
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