

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

THE BOEING COMPANY,

Petitioner,

v.

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA,

Patent Owner.

IPR2024-00761

U.S. Patent No. 7,487,684

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

DEPOSITION OF

PROFESSOR VIJAY GUPTA

Friday, April 11, 2025

10:00 a.m. Eastern Daylight Time

DIGITAL EVIDENCE GROUP

1730 M Street, NW, Suite 812

Washington, D.C. 20036

(202) 232-0646

1 In-Person Deposition of:

2

3 PROFESSOR VIJAY GUPTA,

4 the witness, was called for examination by

5 counsel for Petitioner, pursuant to notice, on

6 Friday, April 11, 2025, commencing at

7 9:59 a.m., held at the law offices of

8 Sughrue Mion PLLC, 2000 Pennsylvania

9 Avenue NW, Suite 9000, Washington, D.C.

10 20006, before Dawn A. Jaques, CSR, CLR, and

11 Notary Public in and for the District of

12 Columbia.

13

14

15

16

17

18

19

20

21

22

1 APPEARANCES:

2 On behalf of the Petitioner:

3 McKOOL SMITH, P.C.

4 By: Casey L. Shomaker, Esq.

5 300 Crescent Court

6 Suite 1200

7 Dallas, Texas 75201

8 (214) 978-4218

9 cshomaker@mckoolsmith.com

10

11 McKOOL SMITH, P.C.

12 By: Arvind Jairman, Esq.

13 1717 K Street, NW

14 Suite 1000

15 Washington, D.C. 20006

16 (202) 370-8324

17 ajairam@mckoolsmith.com

18

19

20 ALSO PRESENT:

21 David Miranda, Boeing representative

22 Amy Gaffney, Boeing in-house counsel

1 APPEARANCES (Continued):

2 On behalf of the Respondent:

3 SUGHRUE MION PLLC

4 By: L. Roman Rachuba II, Esq.

5 Raja N. Saliba, Esq.

6 2000 Pennsylvania Avenue, NW

7 Suite 9000

8 Washington, D.C. 20037-1811

9 (202) 663-7945 (Mr. Rachuba)

10 (202) 663-7468 (Mr. Saliba)

11 lrachuba@sughrue.com

12 rsaliba@sughrue.com

13

14

15

16

17

18

19

20

21

22

1 I-N-D-E-X

2 WITNESS: PAGE:

3 PROFESSOR VIJAY GUPTA

4 Examination by Ms. Shomaker 7, 121

5 Examination by Mr. Rachuba 102

6

7 E-X-H-I-B-I-T-S

8 PETITIONER EXHIBIT: PAGE:

9 Exhibit 1040 March 12, 2024, deposition

10 transcript of Vijay Gupta 18

11

12 RESPONDENT EXHIBIT: PAGE:

13 Exhibit 2013 21 October 2008 Materials

14 Science and Engineering

15 article by Junlan Wang, et al.,

16 "High strain-rate spallation

17 and fracture of tungsten by

18 laser-induced stress waves" 103

19

20

21

22

1 INDEX (Continued)

2

3 PREVIOUSLY MARKED EXHIBITS REFERRED TO

4 EXHIBIT NUMBER: PAGE:

5 Respondent's Exhibit 2011

6 Dr. Gupta Declaration 42

7

8

9

10 REQUEST FOR CONFIDENTIAL DESIGNATION

11 PAGE: LINE:

12 21 15

13 71 22

14

15

16

17

18

19

20

21

22

1 P R O C E E D I N G S

2 (Witness administered the oath.)

3 MS. SHOMAKER: We'll do the read on.

4 This is Casey Shomaker for

5 Petitioner. And with me today is my

6 colleague, Arvind Jairam, and our client

7 representative, David Miranda.

8 MR. RACHUBA: Roman Rachuba,

9 representing Patent Owner, and along with

10 me is my partner, Raja Saliba.

11 Whereupon,

12 PROFESSOR VIJAY GUPTA,

13 was called as a witness, after having

14 been first duly sworn by the Notary

15 Public, was examined and testified as

16 follows:

17 EXAMINATION BY COUNSEL FOR THE PETITIONER

18 BY MS. SHOMAKER:

19 Q Good morning, Dr. Gupta.

20 A Good morning.

21 Q Can you please state your full name

22 for the record?

1 A Vijay Gupta.

2 Q And what is your home address?

3 A 15135 Greenleaf Street,

4 Sherman Oaks, California 91403.

5 Q And do you understand that you are
6 under oath today just as if you were before a
7 judge and jury?

8 A Yes.

9 Q And you understand you're obligated
10 to tell the truth today?

11 A Yes.

12 Q And you're obligated to be honest?

13 A Yes.

14 Q And you're obligated to exercise a
15 duty of candor, correct?

16 A Yes.

17 Q Is there any reason, medical or
18 otherwise, that you cannot be truthful or
19 honest today?

20 A No.

21 Q We'll take a break about once every
22 hour, but if you need a break before then,

1 please just let me know.

2 Do you understand that you cannot
3 discuss the substance of your testimony with
4 your counsel during any breaks today?

5 A Yes.

6 Q How did you prepare for your
7 deposition?

8 MR. RACHUBA: I'm going to caution
9 the witness not to reveal confidential
10 privileged information; otherwise, you
11 can answer.

12 THE WITNESS: I reviewed my
13 declaration. I reviewed all the exhibits
14 which I referred to in my declaration.

15 Then I also had a discussion with
16 the counsel for about an hour or so
17 earlier this week or last week, and then
18 about half a day yesterday.

19 Then I also reviewed an article
20 which I stumbled upon while reviewing my
21 report which was authored by Dr. Wang.
22 It was right on her website, and I have a

1 copy of that article, which was not
2 referred to in my earlier report. So
3 that was one of the articles I reviewed,
4 and I think the deposition transcript of
5 Dr. Wang.

6 I think that pretty much covers what
7 I did for preparing for this deposition.

8 BY MS. SHOMAKER:

9 Q You mentioned several conversations
10 with counsel.

11 Do you recall who participated in
12 those conversations?

13 A There was Mr. Rachuba and
14 Mr. Saliba.

15 Q Anyone from Patent Owner?

16 A No.

17 Q Anyone else related with the
18 university?

19 A No.

20 Q Anyone other than yourself
21 affiliated with LST?

22 A No.

1 Q And approximately how long did your
2 conversations with counsel take place?

3 A As I mentioned earlier, about an
4 hour or so through Zoom.

5 And then it would be yesterday,
6 about half a day.

7 Q And you stated you reviewed
8 Dr. Wang's declaration in preparation for your
9 deposition?

10 A Yes.

11 Q Do you have any thoughts on her
12 declaration?

13 MR. RACHUBA: Objection, form.

14 THE WITNESS: I believe that a lot
15 of my comments have been integrated in my
16 report.

17 BY MS. SHOMAKER:

18 Q Do you have anything to add to your
19 report?

20 MR. RACHUBA: Objection, form.

21 THE WITNESS: I think only by way of
22 this new article I reviewed from

1 Dr. Wang, and I think the summary of this
2 particular article is that it essentially
3 confirms that there's no modified stress
4 wave using the arrangement Dr. Wang has
5 proposed in her future work statement,
6 and it basically directly contradicts the
7 entirety of her declaration.

8 So this is her own article on her
9 website, and it clearly shows. So the
10 entire declaration is completely
11 contradicted by this article of Dr. Wang.

12 BY MS. SHOMAKER:

13 Q And you don't cite that article in
14 your declaration, do you?

15 A No, it was not. I stumbled upon
16 this when I was preparing for this deposition,
17 and I reviewed that article.

18 Q And is there any reason you didn't
19 search for that article prior to preparing
20 your declaration?

21 MR. RACHUBA: Objection, form.

22 THE WITNESS: No. I was actually

1 just focused on her declaration, and I
2 was doing the scientific analysis on the
3 data and all the bases of her opinions,
4 so I was too focused on that aspect.

5 But then once the report was done
6 and I was looking at preparing for this
7 deposition, then I stumbled upon this
8 article.

9 BY MS. SHOMAKER:

10 Q Dr. Gupta, are you planning on
11 providing a supplemental declaration in this
12 IPR?

13 MR. RACHUBA: Objection, form.

14 I'm going to instruct the witness
15 not to answer, as it can reveal
16 privileged and work product information.

17 BY MS. SHOMAKER:

18 Q Dr. Gupta, are you going to follow
19 your counsel's instruction?

20 A Yes.

21 Q You also attended Dr. Wang's
22 deposition, correct?

1 A Yes.

2 Q Do you have any thoughts on
3 Dr. Wang's deposition?

4 MR. RACHUBA: Objection, form.

5 THE WITNESS: I believe I have also
6 integrated aspects of her deposition in
7 my report.

8 BY MS. SHOMAKER:

9 Q Do you have any opinions on Dr. Wang
10 generally?

11 MR. RACHUBA: Objection, form.

12 THE WITNESS: No. I mean, I'm only
13 going to focus on what she provided as a
14 part of her analysis in the report.

15 BY MS. SHOMAKER:

16 Q Do you think Dr. Wang has followed
17 your work over the years?

18 MR. RACHUBA: Objection, form.

19 THE WITNESS: It appears from her
20 publications and the references, she
21 admit to my work. Yes, she has.

22

1 BY MS. SHOMAKER:

2 Q Do you think Dr. Wang was motivated
3 to take your work and improve on it?

4 MR. RACHUBA: Objection, form,
5 foundation.

6 THE WITNESS: Again, I'll say this,
7 based on all the papers I have read, I
8 won't say improvement, but there's a lot
9 of reproduction and confirmation of the
10 work I did prior to her starting the
11 work, and I believe in her thesis there's
12 an aspect which measured the shear
13 strength of the interface, which I
14 believe is the work which is in addition
15 to what I had done before.

16 BY MS. SHOMAKER:

17 Q Would you consider yourself a leader
18 in the field of laser spallation technology?

19 MR. RACHUBA: Objection, form.

20 THE WITNESS: Again, just by way of
21 the history of development of the laser
22 spallation technique, I would say that I

1 was one of the first set of people who
2 quantified the laser spallation
3 technique, which in concept was put
4 together by Dr. Vossen back in 1978.

5 So from that, I would say that I
6 was -- my group was one of the first ones
7 to really quantify the laser spallation
8 technique.

9 BY MS. SHOMAKER:

10 Q Would it surprise you if academics
11 that came after you, like Dr. Wang, were aware
12 of your work?

13 A It's not a surprise because her
14 publications confirm that.

15 Q Would it surprise you if academics
16 that came after you, like Dr. Wang, drew
17 inspiration from your work?

18 A Well, I don't know what
19 "inspiration" means in the context of academic
20 circles, but clearly she references my work,
21 and the work was -- her thesis advisor had met
22 me, as I wrote in my declaration, showing

1 interest in the laser spallation technique.

2 So, yes, they did put together a
3 technique at Urbana-Champaign.

4 Q And by her thesis advisor, you're
5 referring to Dr. Sottos?

6 A Yes.

7 Q And you're personally acquainted
8 with Dr. Sottos?

9 A I met her, yes.

10 Q So you know that Dr. Sottos was
11 aware of your work?

12 A Yes.

13 MR. RACHUBA: Objection, form,
14 foundation.

15 Professor Gupta, if you could please
16 just give me a moment so I can get an
17 objection in before you answer.

18 THE WITNESS: Okay.

19 MS. SHOMAKER: I'm going to
20 introduce what I will mark as
21 Exhibit 1040.

22

1 (Petitioner Exhibit 1040 was
2 marked for identification.)

3 BY MS. SHOMAKER:

4 Q And, Dr. Gupta, are you familiar
5 with Exhibit 1040? And feel free to flip
6 through before you provide a response.

7 MR. RACHUBA: Dr. Gupta, please take
8 your time. Make sure you recognize the
9 document or not.

10 THE WITNESS: Yes.

11 BY MS. SHOMAKER:

12 Q And what is your understanding of
13 what Exhibit 1040 is?

14 MR. RACHUBA: Objection, form.

15 THE WITNESS: I think it's a copy of
16 a deposition I gave in connection with
17 the litigation between Laser Spallation
18 Technologies and The Boeing Company.

19 BY MS. SHOMAKER:

20 Q And, Dr. Gupta, the action in which
21 this deposition was taken involved an
22 assertion of the '684 patent, correct?

1 A Yes. Counsel, is this deposition
2 transcript, has this been designated
3 confidential?

4 MS. SHOMAKER: It was not.

5 MR. JAIRAM: If I can pause for just
6 a logistical question.

7 MS. SHOMAKER: Do you want to stay
8 on record for this?

9 MR. JAIRAM: Could we go off the
10 record for just a minute, please?

11 (Discussion held off the record.

12 Pause in the proceedings to set up
13 Zoom for participants.)

14 BY MS. SHOMAKER:

15 Q I'll just announce for the record
16 that Amy Gaffney from Boeing has joined us via
17 Zoom.

18 And, Dr. Gupta, were you represented
19 by counsel in connection with the deposition
20 you have in front of you?

21 A Yes.

22 Q And is that the same counsel that's

█ [REDACTED]

█ [REDACTED] █ [REDACTED]

3 Q What is the relationship between LST
4 and Patent Owner?

5 A LST is a licensee of the patent.

6 Q But what's the relationship between
7 LST and Patent Owner?

8 MR. RACHUBA: Objection, asked and
9 answered.

10 THE WITNESS: I think that's the
11 relationship.

12 BY MS. SHOMAKER:

13 Q So Patent Owner has no ownership or
14 control over LST?

15 MR. RACHUBA: Objection,
16 mischaracterizing prior testimony.

17 THE WITNESS: Only by way of the
18 licensee.

19 BY MS. SHOMAKER:

20 Q And LST is the exclusive licensee of
21 the '684 patent, correct?

22 MR. RACHUBA: Objection,

1 mischaracterizes previous testimony.

2 THE WITNESS: I don't know. I mean,
3 all I know is that we're licensee, and at
4 the Patent Owner's end, I have no idea.

5 BY MS. SHOMAKER:

6 Q Are you aware of any other persons
7 or entities that have a license to the '684
8 patent?

9 A I have no idea.

10 Q Are you employed by Patent Owner?

11 A Yes.

12 Q So you're employed by both
13 Patent Owner and LST?

14 A Correct.

15 Q Do you receive compensation for your
16 employment by Patent Owner?

17 A Yes.

■ ■ [REDACTED]

■ ■ [REDACTED]

■ [REDACTED]

■ ■ [REDACTED]

■ ■ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

15 Q Okay. So you understand that you're
16 testifying as an expert in this IPR, correct?

17 A Yes.

18 Q And with that comes an obligation to
19 testify about the basis of your opinions that
20 you've expressed in your declaration?

21 A Yes.

22 Q And are you prepared to do that

1 today?

2 A Yes.

3 Q When were you first engaged in this
4 IPR?

5 MR. RACHUBA: Counsel, if you would
6 like to bring counsel back in for that
7 line of questioning.

8 MS. SHOMAKER: We might keep him out
9 for this module too.

10 BY MS. SHOMAKER:

11 Q I'll just repeat the question.
12 When were you first engaged in this
13 IPR?

14 A Can you clarify that? Engaged as?

15 Q When were you first contacted to
16 serve as an expert in this IPR?

17 A I don't recall the exact date, but I
18 believe soon after it was instituted.

19 Q Do you have a formal engagement
20 letter memorializing your work in this IPR?

21 MR. RACHUBA: I'm going to instruct
22 the witness that you can answer to the

1 extent you can do so without revealing
2 privileged information, you can do so.

3 MS. SHOMAKER: I'm just looking for
4 a yes or no here.

5 THE WITNESS: Yeah, I don't recall.

6 BY MS. SHOMAKER:

7 Q Are you being paid to serve as an
8 expert in this IPR?

9 A Yes.

10 Q What rate?

11 A At \$500 an hour.

12 Q And did you determine your rate?

13 A Yes.

14 Q Is that the consulting rate that you
15 charge other clients?

16 A Yes.

17 Q And who's paying you?

18 A That would be the law firm.

19 Q The law firm is paying you?

20 A Yes.

21 Q Is Patent Owner paying you?

22 A Actually, I don't know. Not my

1 knowledge Patent Owner is paying for this.

2 Q Is LST paying for this?

3 A No.

4 Q Have you received any checks or
5 direct deposits associated with your work on
6 this IPR?

7 A Not yet.

8 Q Do you know if any other experts
9 were considered for this IPR?

10 MR. RACHUBA: I'm going to instruct
11 the witness that -- actually, I'm going
12 to instruct the witness not to answer.
13 That would be privileged information.

14 MS. SHOMAKER: I think whether he
15 knows or not is not privileged.

16 Do you know if any other experts
17 were considered?

18 MR. RACHUBA: He can answer -- if he
19 has any personal knowledge that he
20 gleaned by himself, not through
21 communications with the attorneys, he can
22 answer yes or no.

1 To the extent he gained any
2 knowledge from communications with
3 counsel, I'm going to instruct the
4 witness not to answer.

5 BY MS. SHOMAKER:

6 Q Can you answer the question,
7 Dr. Gupta?

8 A Based on the comment I just heard,
9 then I will not answer the question.

10 Q Are you aware of any other experts
11 in the field of laser spallation technology?

12 MR. RACHUBA: Objection, form.

13 THE WITNESS: In what way?

14 BY MS. SHOMAKER:

15 Q Just in a general way. Do you think
16 there's anybody else who is an expert in the
17 field of laser spallation technology?

18 MR. RACHUBA: Objection, form.

19 THE WITNESS: So expert not in the
20 sense of the expert we're talking about,
21 legal expert, but in terms of the general
22 know-how, the technology?

1 BY MS. SHOMAKER:

2 Q That's correct.

3 A It depends what aspect of the
4 technology.

5 Q What about the technology that's
6 disclosed in your patents?

7 MR. RACHUBA: Objection, form.

8 THE WITNESS: I would imagine there
9 are people who would appreciate different
10 aspects of that technology, the people
11 who could use the technology, people who
12 could understand more details about the
13 shock physics and the wave mechanics
14 aspect of the technology.

15 So there are people who appreciate
16 different aspects of it, but somebody who
17 appreciate all of them together, I have
18 to think about it.

19 BY MS. SHOMAKER:

20 Q What about Dr. Nancy Sottos?

21 MR. RACHUBA: Objection, form.

22 THE WITNESS: Well, based on a view

1 of Dr. Wang's thesis, the research
2 articles which stem from her thesis --
3 not that I've reviewed everything -- I
4 find there's some serious scientific
5 errors in the interpretation of the
6 various wave signals.

7 So to the extent that I can --
8 that's my analysis of the work, because I
9 can only go by the work I have reviewed,
10 so whether or not somebody will consider
11 them as an expert would be based on the
12 review.

13 But there are people who can use the
14 technology -- for example, if the laser
15 goes bad, you cannot fix the laser.
16 You're using it as a component in this
17 whole technique.

18 Similarly, when it comes to shock
19 physics or interpretation of the data, I
20 found there was some serious scientific
21 error made in those publications, which I
22 pointed out in my declaration.

1 So it depends upon what aspect of
2 the technology your question would be
3 directed at whether Dr. Sottos or
4 Dr. Wang was an expert or not.

5 BY MS. SHOMAKER:

6 Q Do you know if anyone else --

7 MR. RACHUBA: Counsel, I'm going to
8 lodge a foundation objection to the prior
9 question as well.

10 BY MS. SHOMAKER:

11 Q Do you know of anyone else who's
12 been critical of Dr. Sottos' or Dr. Wang's
13 work?

14 MR. RACHUBA: Objection, form,
15 foundation.

16 THE WITNESS: I don't know.

17 BY MS. SHOMAKER:

18 Q So you're not aware of anyone else
19 sitting here?

20 A I have not looked for either.

21 Q So you're not aware of anyone else
22 who's been critical of her work sitting here?

1 MR. RACHUBA: Objection, misstates
2 prior testimony.

3 THE WITNESS: I've not gone out to
4 look for whether somebody is critical of
5 her work or not.

6 BY MS. SHOMAKER:

7 Q So is that a yes, you're not aware
8 of anyone who's been critical of her work?

9 MR. RACHUBA: Same objection.

10 THE WITNESS: The connotation in the
11 question is whether there's the word of
12 people out there who are critical of her
13 work or supportive of her work. That is
14 something I can't answer --

15 MS. SHOMAKER: And I'm asking --

16 THE WITNESS: -- because I don't
17 know.

18 BY MS. SHOMAKER:

19 Q I'm sorry. I'm asking if you
20 personally are aware of anyone else who's been
21 critical of Dr. Sottos' or Dr. Wang's work
22 sitting here today?

1 MR. RACHUBA: Objection, asked and
2 answered.

3 THE WITNESS: Yeah, I don't know.

4 BY MS. SHOMAKER:

5 Q Dr. Gupta, do you have an interest
6 in the outcome of this IPR, whether
7 financially or personally?

8 A Well, as a named inventor on the
9 patent, of course, intellectually, that's my
10 invention, along with Vassilli Kireev,
11 K-I-R-E-E-V. So as a scientist, I have an
12 interest in the patent.

13 Then as a licensee to the laser
14 spallation technologies, I have an interest in
15 the outcome of this IPR.

16 Q And that's a financial interest in
17 this outcome of the IPR?

18 A Correct.

19 Q And that's because the patent at
20 issue in this IPR has been asserted against
21 Boeing in a district court proceeding?

22 MR. RACHUBA: Objection, foundation,

1 witness, that will be independent of the
2 outcome of the IPR.

3 Q So you will get paid your expert
4 fees regardless of the outcome of the IPR?

5 A That's correct.

6 Q And who will be paying those fees?

7 A I believe I was hired by the law
8 firm, so I would guess, to the extent of my
9 expectation, would be the law firm would be
10 responsible for paying my fees.

11 Q Will LST be responsible for paying
12 your fees?

13 A Excuse me, Counsel?

14 Q Will LST be responsible for paying
15 those fees?

16 A No.

17 Q Will Patent Owner be responsible for
18 paying those fees?

19 A That I have no idea because that
20 would be is there any communication between
21 the counsel and the Patent Owner.

22 Q And so you haven't been told by

1 anyone at Patent Owner that they're
2 responsible for paying your fees; is that
3 correct?

4 MR. RACHUBA: Objection.

5 To the extent you can do so without
6 revealing privileged information, you can
7 answer.

8 THE WITNESS: Yeah, I'm not aware of
9 it.

10 BY MS. SHOMAKER:

11 Q Dr. Gupta, do you want the PTAB to
12 find the challenged claims patentable?

13 MR. RACHUBA: Objection, form.

14 THE WITNESS: Of course.

15 BY MS. SHOMAKER:

16 Q I believe Dr. Gupta did respond.

17 A Yeah, I said that -- I was just
18 going to add that want or do not want is
19 essentially based on the merit of the
20 scientific inquiry; and if the science
21 supports it, then I certainly want the patent
22 to be valid.

1 Q But you personally want the PTAB to
2 find your patent patentable?

3 MR. RACHUBA: Objection, misstates
4 prior testimony.

5 THE WITNESS: See, there's a
6 personal aspect, what you want, then
7 there is a scientist part. So we have to
8 be -- sometimes what we want may not be
9 consistent with what the science must
10 support.

11 So I just want to distinguish that
12 my position here is, as an expert, that
13 the challenged claims should be evaluated
14 in the context of the relevant scientific
15 principles which govern those claims, and
16 if the science supports it, then I
17 certainly want the patent to be valid.

18 BY MS. SHOMAKER:

19 Q As the inventor of the '684 patent,
20 do you want the PTAB to find that the
21 challenged claims are patentable?

22 MR. RACHUBA: Objection, asked and

1 answered.

2 THE WITNESS: I think I have
3 answered the question, Counsel.

4 BY MS. SHOMAKER:

5 Q Can you answer my question, please?

6 MR. RACHUBA: Objection, asked and
7 answered.

8 THE WITNESS: I think it's the same
9 question, Counsel.

10 BY MS. SHOMAKER:

11 Q I'll ask it again.

12 As the inventor of the '684 patent,
13 do you want the PTAB to find the challenged
14 claims patentable?

15 MR. RACHUBA: Objection, asked and
16 answered.

17 THE WITNESS: I believe I am the
18 inventor, so I answered your question --
19 same question earlier, the same answer.

20 BY MS. SHOMAKER:

21 Q What is the answer?

22 MR. RACHUBA: Objection, asked and

1 answered. Objection, relevance.

2 MS. SHOMAKER: Counsel, can you
3 please limit your objections to form, as
4 is required by the PTAB rules?

5 MR. RACHUBA: Counsel, you've asked
6 the same question five times in a row.
7 He's given the answer five times in a
8 row.

9 MS. SHOMAKER: He actually hasn't.
10 So, can you please answer the
11 question?

12 MR. RACHUBA: To the extent you're
13 asking him his personal opinion and not
14 as an inventor, it's outside the scope of
15 testimony -- outside the scope of not
16 just anyone.

17 MS. SHOMAKER: How is -- excuse me,
18 Counsel. How is there any -- his
19 personal opinion is he's the inventor.
20 He's the inventor of the patent that is
21 being challenged in this IPR.

22 He needs to answer the question.

1 MR. RACHUBA: He has answered the
2 question.

3 MS. SHOMAKER: What's the answer,
4 Dr. Gupta?

5 MR. RACHUBA: Objection, asked and
6 answered.

7 MS. SHOMAKER: You still need to
8 answer the question.

9 THE WITNESS: So I'm going to repeat
10 myself the same answer, that as a
11 patent owner or as a personal -- being a
12 personal name on the patent, the patent
13 must be evaluated in the context of the
14 scientific principles which govern this
15 technology.

16 And if the technology supports it, I
17 want the patent to be validated as an
18 inventor, and that will be consistent
19 with what my opinions were as an inventor
20 at the time of filing of the patent.

21 So based on my analysis, which is
22 reflected in my report which I've

1 submitted, it clearly supports the
2 technology -- or my position is supported
3 by the science which governs this
4 technology, and therefore my conclusion
5 is that the patent should be validated.

6 BY MS. SHOMAKER:

7 Q So you want the PTAB to determine
8 that the challenged claims are patentable?

9 MR. RACHUBA: Objection, asked and
10 answered.

11 THE WITNESS: I think the PTAB
12 should make the decision based on the
13 science which I have used in my report,
14 and because there's serious scientific
15 errors which are there in the analysis
16 presented by Dr. Wang, therefore I would
17 like the PTAB to appreciate those aspects
18 of the analysis, and then come to a
19 conclusion on their own based on the
20 analysis I presented.

21 BY MS. SHOMAKER:

22 Q Dr. Gupta, I believe that you

1 brought a copy of your declaration with you
2 today; is that correct?

3 A Yes.

4 Q Is there any writing or notes or
5 anything on that version?

6 A No.

7 Q You're welcome to use that version.
8 This will be Exhibit 2011.

9 Dr. Gupta, at a high level and
10 without revealing any privileged information,
11 can you just tell me about your process for
12 preparing your declaration?

13 MR. RACHUBA: Objection.

14 You can answer to the extent you can
15 do so without revealing privileged
16 information.

17 THE WITNESS: Yeah, the process was
18 to first review my declaration. Then I
19 reviewed all of the exhibits which are
20 referred to in my declaration.

21 Then I reviewed the declaration of
22 Dr. Wang. Then I also reviewed portions

1 of the deposition transcript of Dr. Wang.

2 And then, as I mentioned earlier, I
3 stumbled upon this paper, which I then
4 read, which is the high strain-rate
5 spallation and fracture of tungsten by
6 laser-induced stress waves, so then I
7 spent some time analyzing that paper in
8 the context of the declaration submitted
9 by Dr. Wang, and basically it's
10 completely opposite to what Dr. Wang's
11 position is in her declaration. So I
12 spent some time analyzing this new paper
13 which I uncovered.

14 BY MS. SHOMAKER:

15 Q So, Dr. Gupta, I just want to make
16 sure we're on the same page.

17 Did you look at that paper before
18 you prepared your declaration?

19 A No.

20 Q So that paper has nothing to do with
21 your declaration? It's not cited in it, you
22 didn't review it prior, it doesn't form the

1 basis of the opinions in your declaration,
2 correct?

3 A That's right. So the paper was -- I
4 stumbled upon this paper while I was preparing
5 for this deposition, which was after I had
6 submitted my declaration, correct.

7 Q Do you know if that paper is listed
8 in Dr. Wang's CV that was attached to her
9 declaration?

10 A That I have not checked, but I know
11 this paper was published by her, it was on her
12 website, so I essentially read it on her
13 website.

14 Q So you could have located it prior
15 to submitting your declaration?

16 MR. RACHUBA: Objection, form,
17 foundation, relevance.

18 THE WITNESS: I mean, I could have.
19 Obviously, this paper was published prior
20 to my writing the declaration, but as I
21 mentioned earlier, as an expert, my focus
22 was on reading her declaration, what

1 scientific principles she used. I
2 analyzed her thesis based on the relevant
3 scientific principles of shock physics
4 and wave mechanics.

5 So I was focused on that, and I
6 believe that's maybe the reason why I did
7 not venture out outside the scope of that
8 particular assignment, but it's highly
9 relevant because -- I'm surprised
10 Dr. Wang didn't find this paper, because
11 it is highly relevant, and it's
12 completely opposite to the positions she
13 has taken in her declaration.

14 BY MS. SHOMAKER:

15 Q When did you start work on your
16 declaration?

17 A I don't recall, Counsel.

18 Q Do you recall if it was prior to
19 institution?

20 A I don't believe so, to the best of
21 my recollection.

22 Q So it would have been after the IPR

1 was instituted?

2 A Yes.

3 Q Do you recall when you first started
4 working with counsel for Patent Owner on this
5 IPR?

6 A I don't recall the exact dates.

7 Q Would that have been prior to
8 institution?

9 A I don't believe so, not on this
10 declaration.

11 Q I'm not asking about the
12 declaration.

13 When did you start working with
14 counsel on this IPR?

15 MR. RACHUBA: Objection, form.

16 THE WITNESS: I see, not as an
17 expert. You're asking me in general?

18 BY MS. SHOMAKER:

19 Q Well, let's break that down.

20 You said not as an expert. Have you
21 worked with counsel on this IPR in any other
22 capacity?

1 MR. RACHUBA: Objection, relevance,
2 scope.

3 THE WITNESS: I guess this is -- I'm
4 not sure whether we can call -- I was
5 informed of an institution of an IPR.
6 So, I mean, I have had discussions, which
7 are privileged, with counsel.

8 BY MS. SHOMAKER:

9 Q Did you have -- and I'm just looking
10 for a yes or no here.

11 Did you have discussions with
12 counsel about this IPR prior to institution?

13 MR. RACHUBA: Objection, scope.

14 THE WITNESS: I don't recall.

15 BY MS. SHOMAKER:

16 Q So all of your discussions with
17 counsel about this IPR occurred after
18 institution; is that correct?

19 MR. RACHUBA: Objection, misstates
20 prior testimony.

21 THE WITNESS: Yeah, I don't recall.

22

1 BY MS. SHOMAKER:

2 Q And you attended the deposition of
3 Dr. Wang, correct?

4 A Yes.

5 Q And so at that time, had you already
6 begun working with counsel for Patent Owner on
7 this IPR?

8 A Correct. I think, again, I don't
9 recall the exact timeline of when I started
10 working with the counsel on this IPR. I don't
11 recall, Counsel.

12 Q Why did you attend Dr. Wang's depo?

13 MR. RACHUBA: Objection.

14 I'm going to instruct the witness
15 not to answer, as it calls for privileged
16 information.

17 MS. SHOMAKER: What's the basis of
18 that objection if he can't remember when
19 he was hired?

20 MR. RACHUBA: Sorry?

21 MS. SHOMAKER: He doesn't remember
22 when he was hired.

1 Were you engaged by counsel for your
2 work --

3 MR. RACHUBA: There's a question
4 pending. So the question is -- what's
5 the question again?

6 MS. SHOMAKER: The question is why
7 did you attend Dr. Wang's deposition?

8 MR. RACHUBA: Correct, and that
9 answer would reveal privileged
10 information.

11 MS. SHOMAKER: Why?

12 MR. RACHUBA: Because it would
13 reflect counsel's decision whether or
14 not he -- whether or not he attended the
15 deposition involved consideration by
16 counsel, which would reveal our strategy,
17 so I'm instructing him not to answer on
18 the basis on privilege.

19 BY MS. SHOMAKER:

20 Q Dr. Gupta, had you been engaged to
21 serve as an expert for Patent Owner prior to
22 Dr. Wang's deposition?

1 MR. RACHUBA: Objection, asked and
2 answered.

3 THE WITNESS: Yeah, I don't recall.

4 BY MS. SHOMAKER:

5 Q So it's possible that you had not
6 been engaged at that time?

7 A I have to think, because I don't
8 recall exactly. Given that the same counsel
9 is presenting in both aspects as an expert, so
10 therefore, I'm a little bit not sure when
11 exactly was I, you know, hired to be an expert
12 in this IPR.

13 Q So what was -- I'm sorry, continue.

14 A And then there was, obviously,
15 discussions with the counsel when I'm not an
16 expert related to these matters, so I'm not
17 sure when's the switchover, so that's the
18 reason why I don't recall exactly the date.

19 Q What was your relationship with
20 counsel for Patent Owner at the time of
21 Dr. Wang's deposition?

22 MR. RACHUBA: Objection, asked and

1 answered.

2 THE WITNESS: Yeah, I don't recall
3 when exactly I was -- the roles were
4 switched.

5 BY MS. SHOMAKER:

6 Q You mentioned a switchover.
7 What do you mean by that?

8 MR. RACHUBA: Objection, form.

9 THE WITNESS: The counsel was
10 representing LST in this other
11 litigation, for which we had a
12 deposition, which we discussed earlier in
13 my deposition, and then -- so there was
14 some discussions going on over there.

15 So then at some point, the IPR is
16 instituted, and then I'm hired as an
17 expert, and since they're the same
18 counsel, so that's the reason why that
19 portion where there was a switchover is
20 what I'm not so clear about.

21 And I understand you're trying to
22 get that particular switchover point,

1 which, unfortunately, I don't recall.

2 BY MS. SHOMAKER:

3 Q Do you have any documents that
4 memorialize when you were hired as an expert
5 in this IPR?

6 MR. RACHUBA: Objection.

7 You can answer yes or no.

8 THE WITNESS: No.

9 BY MS. SHOMAKER:

10 Q So you don't have an engagement
11 agreement?

12 A Correct. I answered earlier.

13 Q Did you personally draft your
14 declaration?

15 A Yes.

16 Q The whole thing?

17 A Yes.

18 Q What did you rely on in preparing
19 your declaration?

20 A I think I answered earlier. I
21 relied upon, first of all, the science of wave
22 mechanics, shock physics, and mechanics and

1 materials. That's the fundamental science.

2 And then I relied upon my own
3 experience in developing this technology and
4 working in this area for over 40 years.

5 That is really the scientific
6 foundation I relied upon in analyzing all the
7 material in this particular IPR.

8 Q What documents did you rely on in
9 preparing your declaration?

10 A So when I say "rely upon," I
11 basically reviewed everything, so I would not
12 say what I relied upon.

13 So relied upon would really be the
14 science part, but reviewing, I have listed I
15 believe everything I reviewed in preparing my
16 declaration.

17 Q So everything you reviewed or relied
18 on in preparing your declaration is cited in
19 your declaration; is that correct?

20 A Is cited, but of course, all my
21 experience is not cited, all the science of
22 shock physics is kind of intermittently cited.

1 So all the documents I reviewed is
2 cited; and then this particular additional
3 article by Dr. Wang, that is not cited.

4 Q Because you didn't rely on it,
5 correct?

6 A At that time when I was preparing
7 the report, I didn't have access to. I had
8 not uncovered this particular article, which
9 we are going to discuss why, so that's the
10 reason it's not in my report.

11 But this article just simply
12 confirms basically all my analysis why there's
13 no modification of the compression stress wave
14 by the fused silica.

15 Q Did you have any -- continue.

16 A So all this article is doing, this
17 is essentially reconfirming my entire analysis
18 that Dr. Wang made serious scientific errors
19 in analyzing the data she collected at the
20 time of her thesis, and that has propagated
21 continuously over the years in all her
22 publications.

1 And then in 2009, she does these
2 experiments again, and she finds that when you
3 don't have an effect of a tension wave, you
4 actually don't see the stress modification,
5 and it is in black and white in her own
6 papers.

7 So it completely undermines the
8 entire declaration of Dr. Wang by her own
9 article, which was returned about 8 years
10 later.

11 MS. SHOMAKER: I'm just going to ask
12 for a standing objection to any testimony
13 about that article in that it's not in
14 his declaration and outside the scope so
15 that I don't have to kind of object every
16 time.

17 MR. RACHUBA: Are you objecting to
18 your own line of questioning?

19 MS. SHOMAKER: I didn't ask him any
20 questions about the substance of that
21 article, Counsel. He's adding his --

22 MR. RACHUBA: I'm not asking any

1 questions.

2 MS. SHOMAKER: Exactly. The witness
3 is just providing that testimony on his
4 own, and it's outside the scope of his
5 declaration. He didn't rely on the
6 article.

7 MR. RACHUBA: What is the basis for
8 your objection?

9 MS. SHOMAKER: It's outside the
10 scope and he's just -- he's not -- these
11 are not responsive to my questions.

12 MR. RACHUBA: I don't understand the
13 basis of your objection because I am not
14 asking questions. You are asking
15 questions. You're objecting to your own
16 line of questioning.

17 MS. SHOMAKER: And the witness ---
18 I'm not asking him a question about the
19 article.

20 MR. RACHUBA: He's providing answers
21 in response to your questions. Your
22 objection is in response to your line of

1 questioning.

2 MS. SHOMAKER: Yeah, Counsel, I
3 believe my question was you didn't rely
4 on this in your report.

5 MR. RACHUBA: And he provided an
6 answer, so you're objecting --

7 MS. SHOMAKER: The answer to that is
8 yes or no.

9 MR. RACHUBA: Right, but I didn't
10 ask a question.

11 In a deposition, you make objections
12 to questions. I didn't ask any
13 questions. You are asking questions.

14 MS. SHOMAKER: Counsel, that's not
15 true, but we'll proceed.

16 BY MS. SHOMAKER:

17 Q Did you rely on conversations with
18 anyone in preparing -- I'll start over.

19 How did you gain an understanding of
20 the meaning of the claims of the '684 patent?

21 A That would be a discussion with
22 counsel.

1 Q What did you talk about with
2 counsel?

3 MR. RACHUBA: Objection.

4 I'm going to see if -- I want to
5 listen to his answer to see if there is a
6 relevant privilege objection before he
7 provides his answer.

8 MS. SHOMAKER: So you guys want to
9 sidebar?

10 MR. RACHUBA: Yes.

11 MS. SHOMAKER: Okay.

12 MR. SALIBA: Can we go off record?

13 (A break was taken at 10:50 a.m. for
14 counsel to consult with the
15 witness.)

16 (Resume at 10:52 a.m.)

17 MR. RACHUBA: We can go back on the
18 record.

19 MS. SHOMAKER: Okay.

20 MR. RACHUBA: So I do not have a
21 privilege objection to Professor Gupta's
22 answer. I think he may have

1 misunderstood the question.

2 THE WITNESS: Counsel, can you
3 kindly repeat the question, please?

4 BY MS. SHOMAKER:

5 Q How did you gain an understanding of
6 the meaning of the claims of the '684 patent?

7 A So those were based on what a person
8 of skill in the art would understand those
9 terms in view of the specification and
10 prosecution history of the patent.

11 Q And what did you consider in
12 determining what a person of ordinary skill in
13 the art would understand?

14 A It would be the plain and ordinary
15 meaning in view of the specification and the
16 prosecution history of the patent.

17 Q Did you consider any materials in
18 forming that understanding other than the
19 patent itself and the prosecution history?

20 A And my understanding of how a person
21 of ordinary skill in the art would understand
22 the meaning of these terms based on how we

1 define a person of skill in the art.

2 Q It's a yes-or-no question, but have
3 you ever been informed by counsel as to the
4 meaning of the claim terms of the '684 patent?

5 A I don't recall if I've had a
6 discussion.

7 Q So you've never had a conversation
8 with counsel about the meaning of the claim
9 terms of the '684 patent?

10 MR. RACHUBA: Objection, misstates
11 prior testimony.

12 THE WITNESS: Yeah, I don't recall
13 any discussions.

14 BY MS. SHOMAKER:

15 Q Did you have any conversations with
16 your coinventor about the meaning of the claim
17 terms in the '684 patent?

18 A I do not believe so.

19 Q What about anyone from Patent Owner?

20 A I don't believe so.

21 Q Dr. Gupta, if you could please turn
22 to -- actually, now is probably a good time

1 for a break.

2 (A break was taken at 10:55 a.m.)

3 (Resume at 11:10 a.m.)

4 BY MS. SHOMAKER:

5 Q Welcome back, Dr. Gupta.

6 Did you have any discussions with
7 counsel about the substance of the testimony
8 you've already offered or will offer during
9 the break?

10 A No.

11 Q Okay. Could you please turn to
12 paragraph 10 of your declaration?

13 And, Dr. Gupta, in the last sentence
14 of paragraph 10, you state, "At age 31, I
15 became the youngest full professor with tenure
16 in the United States."

17 Do you see that?

18 A Yes.

19 Q How do you know that?

20 A Well, to the best of my knowledge.

21 Q Did you do anything to verify that
22 that statement is true?

1 A I didn't go out and do -- spend time
2 looking for it, but that's what a dean told me
3 when they hired me at UCLA.

4 Q So you're just assuming that that
5 statement is true?

6 A Well, I have not come across
7 personally anyone over the last 40 years.

8 Q Is it possible that statement is not
9 accurate?

10 A I stand by my answer. To the best
11 of my knowledge, in the last 40 years, I
12 haven't seen a case like that. People I spoke
13 to, they haven't seen a case like that.
14 That's my basis.

15 Q What people have you spoken to about
16 that?

17 A Professors in academic circles, and
18 I go to conferences, so that's the domain of
19 my knowledge.

20 Q And so you've asked them have you
21 ever met a younger full professor with tenure?

22 A Well, I mean, it comes up in

1 conversations, but that's not the focus of the
2 conversation, but sometimes when you are
3 discussing, these things come up. So that's
4 my understanding.

5 Q You haven't done anything to
6 independently verify whether or not you are
7 indeed the youngest full professor with tenure
8 at the age of 31?

9 A Right. I've not sent out letters to
10 all the universities asking for that. The
11 answer is no, I have not done.

12 Q If you found out that statement
13 wasn't true, would you remove it from your
14 declaration?

15 A Of course. If it's true, then I
16 would say one of the youngest ones then.

17 Q If you look down in paragraph 12, in
18 the middle there's a sentence that starts
19 with, "I am widely acknowledged as the leading
20 experimentalist in the field of solid
21 mechanics." Do you see that?

22 A Yes.

1 Q What does "widely" mean in that
2 sentence?

3 A "Widely" would be just again my
4 interactions with the professional community,
5 the reflections I've got from the professional
6 community when I'm working with based on my
7 consulting I've done in the industry.

8 So that is really the basis of my
9 statement.

10 Q And so who has acknowledged you as
11 the leading experimentalist?

12 Can you name any names?

13 A Well, let's see. So, first of all,
14 at UCLA, they hired me from Assistant
15 Professor directly to Full Professor with
16 tenure, so I think -- so that will be like one
17 of the data points which would suggest that
18 when the committee formed that looks into a
19 peer review trying to give tenure to somebody
20 from outside, and going 10 years above, that
21 is one data point.

22 Then the committee writes to people

1 who are leaders in the field, so I presume
2 they got letters from those leaders, and
3 probably based on that, they provided that
4 unusual position when they hired me at UCLA.

5 Then researchers at Intel
6 Corporation, Texas Instruments, Hitachi,
7 Boeing, and other major semiconductor
8 companies calling me asking me for my advice
9 on how to measure adhesion or adhesion-related
10 problems, and these are companies throughout
11 the world.

12 So I think that is another data
13 point which would suggest that maybe I'm known
14 in those circles and the work I've done had
15 made some impact.

16 So now I have a researcher who has,
17 at least based on this -- based on this reach,
18 right, where people are trying to reach me --
19 I didn't reach out to them, so these are the
20 companies who are reaching out to me -- so I
21 would imagine that people calling me from
22 India, China, Japan, Korea, and a lot of the

1 European countries asking me to come, give
2 invited talks at conferences, asking me to
3 give invited talks.

4 I think that is really the basis on
5 which I'm making a statement, and that's my
6 basis. So I gave you why I wrote the
7 statement that, given the reach, given the
8 peer-review process at UCLA, that I wrote this
9 sentence in my declaration.

10 Q Have any of the people or entities
11 that you just listed told you that you are the
12 leading experimentalist?

13 A A lot of times you have to just --
14 based on -- no.

15 I mean, when we communicate to each
16 other, we don't tell each other that you are
17 the world famous guy or you're the world
18 famous in the field.

19 So it is somewhat embarrassing to
20 actually have a discussion of this type, but
21 I'm just providing you the basis on which I
22 wrote this sentence.

1 Q So this is your opinion of yourself?

2 A No. I gave you the basis, Counsel,
3 so let's be very clear. It's the basis on
4 which I'm writing the statement.

5 And also remember what context we're
6 writing this statement in. This is a part of
7 a declaration and expert's opinion. Prior to
8 the expert opinion, the expert's profile or
9 position in the field is also a part of the
10 evaluation of this expert report.

11 Q Right. But nobody in the field has
12 ever told you that you are the leading
13 experimentalist verbatim, correct?

14 A Like which way?

15 Q No one has ever walked up to you and
16 said you are the leading experimentalist in
17 the field of solid mechanics?

18 A Well, a lot of people is what told
19 me on my face all the great accomplishments
20 I've made when I'm in conferences.

21 Q Who told you?

22 A I don't recall. I mean, there are a

1 lot of people who I meet. I met probably
2 thousands of people over my career, and
3 sometimes people come, you know, after a
4 presentation -- I've done too -- a lot of
5 people, I go out and say what a great talk,
6 and so I think this is very common.

7 Q At the bottom of page 4, in
8 paragraph 12, and continuing to page 5, you
9 write the sentence, "My research has been
10 widely disseminated in these areas."

11 Do you see that?

12 A Yes.

13 Q What do you mean by "widely" here?

14 A I mean publishing in leading
15 research journals, and the examples I gave you
16 about the companies who have reached out to me
17 throughout the world, including Boeing.

18 Then companies who have invited me
19 to give presentations on the premises
20 throughout the world.

21 There are government agencies
22 throughout the world who have invited me to

1 make a presentation, universities throughout
2 the world.

3 So I think in that sense, I'm using
4 the word "widely disseminated."

5 Q Has your research ever been included
6 in a commercial embodiment or tool?

7 A Yes.

8 MR. RACHUBA: Objection, form.

9 BY MS. SHOMAKER:

10 Q What commercial embodiment or tool?

11 A That would be the laser spallation
12 technique.

13 Q Have you ever created a commercial
14 embodiment or tool that embodies your
15 research?

16 A Yes.

17 Q What tool?

18 MR. RACHUBA: Objection to form.

19 THE WITNESS: The laser spallation
20 technology.

21 BY MS. SHOMAKER:

22 Q So is that a tangible product?

1 A Yes.

2 Q And where is that located?

3 A It's right in Intel Corporation.

4 Q And you personally created that?

5 A In association with engineers inside
6 Intel.

7 Q Do you recall when that work --

8 MR. RACHUBA: I'm going to caution
9 that this is also confidential
10 information, this line of questioning
11 with Boeing's counsel.

12 MS. SHOMAKER: I think it's
13 disclosed in his district court
14 deposition, which was publicly filed, so
15 I think we can --

16 MR. RACHUBA: Can you show me where?

17 MR. SALIBA: Can we go off the
18 record for one second?

19 MS. SHOMAKER: Yeah.

20 (Off the record at 11:22 a.m.)

21 (Discussion held off the record.)

22 (Resume at 11:23 a.m.)

1 BY MS. SHOMAKER:

2 Q Dr. Gupta, are you currently under
3 an NDA with Intel?

4 A I don't recall. I did transfer
5 their technology back in 1999 or 2000 time
6 frame, so what I signed, frankly speaking, I
7 don't recall.

8 But to the extent that I -- I can
9 say that I did transfer the technology to
10 Intel, so that's not under any restrictive
11 order.

12 Q What do you mean by "transfer the
13 technology"?

14 MR. RACHUBA: Dr. Gupta, to the
15 extent you believe any of your testimony
16 is going to be subject to a third-party
17 confidentiality order, you can proceed to
18 answer the question here.

19 We'd just ask that Boeing's in-house
20 counsel not be present for this line of
21 questioning and that the transcript be
22 noted as highly confidential, attorneys'

1 eyes only.

2 So at any point in preparing your
3 answer, just please let me know and we
4 can accommodate that.

5 THE WITNESS: I think I've already
6 answered that previously to the extent I
7 feel comfortable talking about it, that
8 the entire laser spallation tool was
9 created under my supervision inside Intel
10 with the engineers.

11 So I think that's to the extent --
12 that's the maximum I can say.

13 BY MS. SHOMAKER:

14 Q Is it your understanding that the
15 tool that was transferred to Intel practiced
16 any claims of the '402 patent?

17 MR. RACHUBA: I'm going to object on
18 this line of questioning being outside
19 the scope of his declaration.

20 I'm also going to caution the
21 witness that to the extent he can answer
22 without revealing privileged information,

1 he can do so, but any infringement
2 analysis with a third party not present
3 here is likely going to be privileged.

4 But if he has any independent
5 personal knowledge, then he can answer
6 that question.

7 THE WITNESS: No, I don't have any
8 personal knowledge about infringement or
9 any claim construction about the
10 '402 patent and the Intel, but all I know
11 is that that technology was transferred.

12 BY MS. SHOMAKER:

13 Q Do you have any personal knowledge
14 about the meaning of the claims in the
15 '402 patent as the inventor of the
16 '402 patent?

17 A It would be --

18 MR. RACHUBA: Objection, scope.

19 THE WITNESS: It would be just the
20 plain and ordinary meaning in the context
21 of the prosecution history and the
22 specification as understood by a person

1 of skill in the art.

2 BY MS. SHOMAKER:

3 Q Do you think anybody else in the
4 industry is using any of your research in a
5 commercial embodiment?

6 MR. RACHUBA: Objection, form.

7 Objection, scope. Objection, foundation.

8 THE WITNESS: Again, I don't know.

9 BY MS. SHOMAKER:

10 Q You don't know if any major
11 semiconductor companies are making use of your
12 research?

13 MR. RACHUBA: Same objections.

14 THE WITNESS: They have used it in
15 collaboration in research with me that
16 they chose to come to my lab, both at
17 Dartmouth College and at UCLA, and worked
18 with me for product development, to use
19 my lab as a research -- internal
20 research, and optimize their materials
21 for the chips.

22 So that aspect did happen, so to

1 that extent, that work continued for
2 many, many years.

3 BY MS. SHOMAKER:

4 Q And are those parties making use of
5 any of the research disclosed in your patents?

6 MR. RACHUBA: Objection, form,
7 foundation, scope, relevance.

8 THE WITNESS: Yes. When I'm using
9 the laser spallation technique to
10 interact with those companies, then I'm
11 using the -- certainly the '402 patent.

12 BY MS. SHOMAKER:

13 Q But not the '684 patent?

14 MR. RACHUBA: Objection, form,
15 foundation, scope, relevance.

16 THE WITNESS: Some of them with '684
17 as well, yes.

18 BY MS. SHOMAKER:

19 Q Which ones?

20 A I can't disclose.

21 MS. SHOMAKER: Would you mind
22 stepping out?

1 MR. MIRANDA: Sure, of course.

2 MS. SHOMAKER: And, Amy, would you
3 mind dropping off zoom?

4 MR. RACHUBA: Same objections, form,
5 foundation, scope, relevance.

6 Let's go off the record for one
7 second.

8 MS. SHOMAKER: Okay.

9 (Discussion held off the record.)

10 MR. RACHUBA: So I'll reiterate the
11 objection that my co-counsel just made.

12 Dr. Gupta, to the extent -- I know
13 we designated this transcript as
14 confidential. That does not excuse you
15 from your obligations of
16 confidentially owed -- that does not
17 necessarily excuse you from obligations
18 of confidentiality that you may owe to
19 other third parties.

20 So to the extent you feel like
21 you're putting those obligations in
22 jeopardy, you do not need to answer

1 questions that would require you to
2 violate those obligations and
3 confidentiality.

4 MS. SHOMAKER: And we would
5 disagree, as the only basis to avoid
6 answering our question in a deposition is
7 a privilege instruction.

8 So, Dr. Gupta, you do need to tell
9 the truth here and are obligated to tell
10 the truth in this deposition.

11 Do you understand that?

12 THE WITNESS: I understand that, but
13 I also understand the objection which the
14 counsel just made -- or the commentary
15 the counsel just made.

16 MR. RACHUBA: Dr. Gupta, to be
17 clear, you can answer at a high level.

18 THE WITNESS: No, I understand that.

19 MR. SALIBA: And, Counsel, we can
20 look at the default protective order in
21 this IPR during a break and get you an
22 understanding.

1 MS. SHOMAKER: Sure.

2 BY MS. SHOMAKER:

3 Q Dr. Gupta, before the break, I
4 believe you testified that there were some
5 companies practicing the '684 patent.

6 Which companies are those?

7 MR. RACHUBA: Objection, form,
8 foundation, relevance, with the same
9 instruction regarding confidentiality I
10 stated earlier.

11 THE WITNESS: What was the question,
12 if you can kindly tell me, before the
13 break, to which I asked -- answered that
14 question?

15 BY MS. SHOMAKER:

16 Q Yes. I believe I asked you if you
17 were aware of any companies that were
18 practicing the '684 patent.

19 A What was the specific question?

20 Q Dr. Gupta, you're not permitted to
21 look at the realtime.

22 A No, I know, but I'm asking you what

1 was the specific question before the break?

2 Q I asked you, "And are those parties
3 making use of any of the research disclosed in
4 your patents?" You answered, "Yes."

5 A But that is not the question you
6 asked, Counsel. You just asked me about a
7 '684 patent.

8 Q Yes.

9 A Was that the question?

10 Q Yes.

11 A It was not. You asked me about the
12 research going there. Research is -- I do
13 research in so many different areas, Counsel,
14 so let's be very specific so you can -- so
15 you're able to do this in a proper way.
16 You're not going to trick any questions.
17 You're going to ask the question.

18 So if you represent to me just now
19 that I asked the same question before the
20 break -- and it is only an hour into the
21 deposition, I remember what questions you
22 asked -- so therefore, I was very particular

1 about you pointing out.

2 So if you can kindly tell me which
3 question you asked me which asked exactly the
4 same question.

5 Q The verbatim question I asked you, I
6 asked you, "But not the '684 patent?" And you
7 answered, "Some of them with the '684 patent
8 as well, yes." And I asked you, "Which ones?"

9 MR. RACHUBA: Same objections as
10 before, same instruction.

11 THE WITNESS: I'm still not clear
12 what the question was.

13 I think there must be a sequence of
14 questions you asked, so I would request
15 that you ask -- re-read those sequence of
16 questions, because I want to make sure
17 that the record is clear.

18 BY MS. SHOMAKER:

19 Q Let's make the record clear.

20 Dr. Gupta, what companies do you
21 believe practice the '684 patent?

22 MR. RACHUBA: Objection, form,

1 scope, relevance, and privilege.

2 To the extent you can answer without
3 revealing privileged information, you can
4 do so.

5 THE WITNESS: Yeah, I can't answer
6 that.

7 BY MS. SHOMAKER:

8 Q Why not?

9 A Because we haven't -- because of --
10 that will disclose some privileged
11 information.

12 Q So your counsel told you who
13 practiced the patent?

14 MR. RACHUBA: Objection, misstates
15 prior testimony.

16 THE WITNESS: No.

17 BY MS. SHOMAKER:

18 Q Then why won't you answer my
19 question?

20 A Because I also have an understanding
21 of the patent, and the work is still ongoing,
22 so I can answer the question whether those

1 companies are practicing the patent or not.

2 Q You said you have an understanding
3 of the patent and the work is ongoing.

4 What are you referring to?

5 MR. RACHUBA: I'm going to caution
6 the witness that if your understanding is
7 based on privileged communications with
8 counsel, to not reveal the substance of
9 that understanding.

10 To the extent you have an
11 independent understanding that is not
12 based on privileged information, you can
13 answer the question.

14 I'm also objecting on the scope,
15 relevance -- scope, relevance, form.

16 THE WITNESS: So I can't answer the
17 question because I haven't really -- we
18 haven't -- so there's -- that work is
19 still ongoing regarding that analysis.

20 BY MS. SHOMAKER:

21 Q What work are you referring to in
22 your answer?

1 A The question you asked.

2 MR. RACHUBA: Same objections.

3 MS. SHOMAKER: Let's take a

4 five-minute break.

5 (A break was taken at 11:35 a.m.)

6 (Resume at 11:45 a.m.)

7 BY MS. SHOMAKER:

8 Q Welcome back, Dr. Gupta.

9 Can you pronounce for me your
10 co-inventor on the '684 patent's name?

11 A Vassilli Kireev.

12 Q And did you collaborate with
13 Mr. Kireev on the work that led to
14 the '684 patent?

15 A Yes.

16 Q And do you recall what you
17 contributed to the patent versus what
18 Mr. Vassilli contributed?

19 A Yeah, I don't recall. It was a long
20 time back.

21 Q And Mr. Vassilli is not an inventor
22 on the '402 patent, correct?

1 A That is correct.

2 Q What is quartz?

3 MR. RACHUBA: Objection, form.

4 THE WITNESS: Clarify the question.

5 BY MS. SHOMAKER:

6 Q What's your understanding of what
7 quartz is?

8 MR. RACHUBA: Objection, form.

9 THE WITNESS: Quartz is basically a
10 crystalline form of silica.

11 BY MS. SHOMAKER:

12 Q And what's the chemical composition
13 of quartz?

14 MR. RACHUBA: Objection, form,
15 scope, relevance.

16 THE WITNESS: Depends upon -- it's
17 polycrystalline, and you can have a lot
18 of impurities, so depends who
19 manufactures it, but predominantly SiO₂.

20 BY MS. SHOMAKER:

21 Q And what is silica?

22 MR. RACHUBA: Objection, form.

1 Object to scope. Object to relevance.

2 THE WITNESS: So silica would be,
3 again, a disordered material of SiO₂.

4 BY MS. SHOMAKER:

5 Q What's fused quartz?

6 MR. RACHUBA: Objection, form,
7 scope, relevance.

8 THE WITNESS: So fused quartz would
9 be you take different crystals of quartz,
10 artificially you put them together, and
11 you take it to a high temperature, and
12 then you'll form a disordered structure
13 of fused quartz.

14 BY MS. SHOMAKER:

15 Q What's fused silica?

16 A So fused silica would be equivalent
17 to fused quartz.

18 MR. RACHUBA: So objection, form,
19 scope, relevance to the previous
20 question.

21 BY MS. SHOMAKER:

22 Q Would you mind repeating your

1 answer? I don't think it came through.

2 A So the fused silica would be
3 essentially the amorphous form or the
4 disordered form of SiO₂.

5 MR. RACHUBA: I'm not sure if my
6 objection came up either.

7 So I had the same form, scope,
8 relevance objection to the prior
9 question.

10 BY MS. SHOMAKER:

11 Q Is it your understanding that the
12 terms "fused quartz" and "fused silica" can be
13 used interchangeably?

14 MR. RACHUBA: Objection, form.

15 THE WITNESS: It depends upon in
16 what context.

17 BY MS. SHOMAKER:

18 Q In what context could they be used
19 interchangeably?

20 A Interchangeably would be assuming
21 that they have the same level of impurities,
22 exactly identical, then from a materials

1 science point of view, they will be considered
2 equivalent.

3 Q What's your understanding of the
4 term "glass"?

5 MR. RACHUBA: Objection, form.

6 THE WITNESS: In what context?

7 BY MS. SHOMAKER:

8 Q Just as a general term. If someone
9 asked you is this glass, what definition of
10 "glass" would you use?

11 MR. RACHUBA: Objection, form,
12 scope, relevance.

13 THE WITNESS: The glass would be
14 amorphous form of SiO₂, predominantly
15 SiO₂, but could have impurities, sodium,
16 silicate.

17 BY MS. SHOMAKER:

18 Q And is it your understanding that
19 the glass element in the '684 patent includes
20 silica glass?

21 A The silica glass does not qualify as
22 a glass element in the '684 patent.

1 Q Does the term "glass element" as
2 used in the patent describe materials that
3 result in the modifying of a stress wave
4 profile when it's transmitted through their
5 thickness?

6 A Sorry, Counsel, I missed one
7 critical word which you said in your sentence
8 in the beginning.

9 Q I'll restate the question.
10 Does the term "glass element" as
11 used in the patent describe materials that
12 result in the modifying of a stress wave
13 profile when it is transmitted through their
14 thickness?

15 MR. RACHUBA: Objection, form.

16 THE WITNESS: Modified in a certain
17 way, yes, so the answer would be still
18 no. You'll give more details.

19 BY MS. SHOMAKER:

20 Q Is an epoxy a glass within the
21 meaning of the '684 patent claims?

22 MR. RACHUBA: Objection, form and

1 relevance.

2 BY MS. SHOMAKER:

3 Q Is an epoxy a glass element --

4 MR. RACHUBA: Objection, form,
5 scope, relevance.

6 MS. SHOMAKER: -- within the context
7 of the '684 patent?

8 THE WITNESS: Again, I will have to
9 look at more details about the structure
10 of the epoxy and how it deforms under
11 shock conditions. So without knowing
12 that, I can't answer the question.

13 BY MS. SHOMAKER:

14 Q Is a Hysol EA9394 epoxy a glass
15 element within the meaning of the '684 patent?

16 MR. RACHUBA: Objection, form, scope
17 and relevance. And to the extent you're
18 asking about an infringement analysis,
19 I'm going to instruct the witness not to
20 answer if doing so would reveal
21 privileged information.

22 To the extent you have an

1 independent view on whether this material
2 would infringe the '684 patent that you
3 obtained not through counsel, you can
4 answer the question.

5 BY MS. SHOMAKER:

6 Q Dr. Gupta, do you have an
7 independent understanding of the meaning of
8 "glass element" as used in the '684 patent?

9 A Yes.

10 Q And what is that understanding based
11 off of?

12 MR. RACHUBA: Objection, form.

13 THE WITNESS: Based on the
14 description in the specification and the
15 prosecution history on the patent as
16 understood by a person of skill in the
17 art.

18 BY MS. SHOMAKER:

19 Q So based on the description in the
20 specification and the prosecution history as
21 understood by a person of skill in the art, is
22 a Hysol EA9394 epoxy a glass element in the

1 context of the '684 patent?

2 MR. RACHUBA: Objection, form.

3 Objection, scope. Objection, relevance.

4 I'm going to instruct the witness
5 that to the extent the question is
6 seeking an infringement analysis that was
7 obtained through counsel, do not answer,
8 as it would reveal privileged
9 information.

10 If you have an independent
11 infringement analysis basis, you can
12 answer the question.

13 BY MS. SHOMAKER:

14 Q Dr. Gupta, you understand I'm not
15 asking for your infringement opinion, correct?

16 MR. RACHUBA: Objection, form,
17 foundation, scope, relevance.

18 THE WITNESS: Well, I mean, so I
19 don't know what context you're asking
20 this because, obviously, I'm here to
21 answer the question about a declaration,
22 and none of these epoxies are anywhere in

1 my declaration.

2 So I don't know what the scope or
3 the intent of asking the question is, but
4 I was told that this deposition is about
5 this IPR and the declaration I've
6 written; and in the declaration, I don't
7 believe there is any discussion or
8 analysis of the Hysol epoxy being a glass
9 element or not.

10 So I don't know -- well, the
11 question you asked was whether this is my
12 infringement analysis or what analysis.
13 All I know is that this is outside the
14 scope of this declaration.

15 BY MS. SHOMAKER:

16 Q Dr. Gupta, in your declaration, you
17 offer opinions about what satisfies the glass
18 element limitations of the '684 patent,
19 correct?

20 MR. RACHUBA: Objection, form.
21 Objection, scope. Objection, misstates
22 prior testimony.

1 THE WITNESS: I do, yes, what a
2 glass element is in the context of the
3 '684 patent, yes.

4 BY MS. SHOMAKER:

5 Q And so is a Hysol -- which is
6 spelled H-Y-S-O-L -- EA9394 epoxy a glass
7 element in the context of the '684 patent?

8 MR. RACHUBA: Objection, form.
9 Objection, scope. Objection, relevance.

10 And I caution the witness that to
11 the extent you can provide infringement
12 analysis that you obtained without
13 conversations with counsel, you can do
14 so, but I'm going to caution the witness
15 not to reveal privileged infringement
16 information relating to -- privileged
17 information related to an infringement
18 analysis.

19 THE WITNESS: Based on the
20 structure, just independent, it can
21 deform and act as a glass element.

22 But again, I cannot -- I will have

1 to do some more analysis in order to
2 confirm that.

3 BY MS. SHOMAKER:

4 Q Is fiberglass a glass element in the
5 context of the '684 patent?

6 MR. RACHUBA: Objection, form.

7 Objection, scope. Objection, relevance.

8 I will also caution the witness not
9 to reveal privileged information.

10 To the extent he can provide his
11 independent opinion on this irrelevant
12 infringement analysis, he can do so.

13 THE WITNESS: Without any additional
14 work, I can't really answer the question.

15 BY MS. SHOMAKER:

16 Q Can a composite panel be a glass
17 element in the context of the '684 patent?

18 MR. RACHUBA: Objection, form.

19 Objection, scope. Objection, relevance.

20 I caution the witness not to reveal
21 privileged information.

22 To the extent you can answer the

1 question, Professor Gupta, without
2 revealing a privileged infringement
3 analysis, you can do so.

4 THE WITNESS: Yes, I don't have an
5 opinion without doing some additional
6 analysis.

7 BY MS. SHOMAKER:

8 Q What about adhesive tape? Can it be
9 a glass element in the context of the
10 '684 patent?

11 MR. RACHUBA: Objection, form.
12 Objection, scope. Objection, relevance.
13 Objection to foundation.

14 I will caution the witness not to
15 reveal privileged information.

16 To the extent you can answer the
17 question without revealing privileged
18 infringement analysis, you can do so.

19 THE WITNESS: The same answer. So
20 without doing some more -- I don't have
21 an opinion instantly until I do some more
22 additional analysis.

1 BY MS. SHOMAKER:

2 Q What about an EMAT, which is
3 E-M-A-T, sensor tape? Is that a glass element
4 in the context of the '684 patent?

5 MR. RACHUBA: Objection, form,
6 scope, relevance, foundation.

7 I caution the witness not to reveal
8 privileged information.

9 To the extent you can answer the
10 question, Professor Gupta, without
11 revealing privileged information --
12 actually, to the extent this potentially
13 calls for privileged information, I would
14 like to listen to the answer first, so
15 let's take a brief minute break off the
16 record.

17 MS. SHOMAKER: That's fine.

18

19 (A break was taken at 11:58 a.m.
20 for counsel to consult with the
21 witness.)

22 (Resume at 12:01 p.m.)

1 BY MS. SHOMAKER:

2 Q I'll ask the previous question.

3 What about an EMAT, which is
4 E-M-A-T, sensor tape? Is that a glass element
5 in the context of the '684 patent?

6 MR. RACHUBA: Objection, form,
7 foundation, scope, relevance.

8 I caution the witness not to reveal
9 privileged information.

10 To the extent you can answer the
11 question without revealing privileged
12 infringement analysis, you can do so.

13 THE WITNESS: I think these are
14 potential glass elements, it can, but
15 I'll have to do some more work in order
16 to establish that.

17 MS. SHOMAKER: Counsel, now might be
18 a good time for lunch.

19 MR. RACHUBA: Yeah, you saw it was
20 here, so that's fine.

21 MS. SHOMAKER: Go off record, yeah.

22 (Lunch break taken at 12:02 p.m.)

1 (Resume at 12:51 p.m.)

2 BY MS. SHOMAKER:

3 Q Welcome back, Dr. Gupta.

4 A Thank you.

5 Q And during the break, did you
6 discuss the contents of your testimony, past
7 or future, with your counsel?

8 A No.

9 Q Prior to the break, do you recall I
10 was asking you whether or not certain elements
11 satisfied the glass element limitation of the
12 '684 patent?

13 A Yes.

14 Q And I believe you testified that you
15 would have to do some additional work to
16 determine whether or not that was the case.

17 Do you recall that?

18 A Correct. And I also said that they
19 may based on just the description, but I may
20 have to do extra work, yes.

21 Q What type of extra work would you
22 need to do?

1 A Some more analysis of the waveform,
2 how it gets modified, and that would be
3 through either, you know, review of the past
4 references, or it could be some
5 experimentation. It could be just looking at
6 the detailed structure, at the material
7 structure.

8 So I have to look at what
9 specifically was used in a particular
10 allegedly infringing product.

11 So all of those parameters would
12 have to be considered before I come to a final
13 opinion; however, given the general structure
14 of those elements, it can, or they could.

15 Q What about the --

16 MR. RACHUBA: Objection, scope and
17 relevance to the prior question.

18 BY MS. SHOMAKER:

19 Q What about the structure of those
20 elements indicates to you that they might be a
21 glass element within the context of the
22 '684 patent?

1 MR. RACHUBA: Objection, form,
2 scope, relevance.

3 And again I will caution the witness
4 that to the extent you can answer without
5 revealing attorney-client privilege, you
6 can do so. If you have an independent
7 basis for this infringement analysis, you
8 can answer the question.

9 THE WITNESS: I think to the extent
10 that I can describe in my '684 patent,
11 the type of materials, the type of
12 structures which are -- any structure
13 which is able to modify the wave in the
14 particular fashion which I discuss in the
15 '684 patent would qualify for a glass
16 element.

17 BY MS. SHOMAKER:

18 Q Can you describe to me the type of
19 experiments you would need to engage in to
20 determine whether or not those materials could
21 modify the wave?

22 MR. RACHUBA: Objection, form,

1 scope, relevance, and to the extent you
2 can answer without revealing privileged
3 information.

4 THE WITNESS: So I want to also make
5 sure that the experiments are not the
6 only way to come to a conclusion whether
7 or not a particular element is a glass
8 element or not, but experimentation will
9 essentially involve similar to what has
10 been described in the '684 patent, and
11 then looking at the waves before and
12 after they pass through the glass
13 element, and come to a conclusion based
14 on that.

15 BY MS. SHOMAKER:

16 Q Dr. Gupta, are there any errors that
17 you noticed in your declaration when you were
18 preparing for the deposition?

19 MR. RACHUBA: Objection, form.

20 THE WITNESS: I reviewed it very
21 quickly. There might be some typos, I
22 believe, maybe micron would be -- a

1 symbol might go back to a rectangle or a
2 square.

3 Other than that, I didn't really see
4 anything that showed errors in my report.

5 BY MS. SHOMAKER:

6 Q Dr. Gupta, do you still stand by
7 everything written in your declaration today?

8 A Yes.

9 MS. SHOMAKER: I'll pass the
10 witness.

11 MR. SALIBA: Let's take a break.

12 MR. RACHUBA: Yes, let's take a
13 break. 10 minutes?

14 MS. SHOMAKER: Sure.

15 MR. SALIBA: Let's go off the
16 record.

17 (A break was taken at 12:56 p.m.)

18 (Resume at 1:15 p.m.)

19 EXAMINATION BY COUNSEL FOR PATENT OWNER

20 BY MR. RACHUBA:

21 Q Welcome back, Professor Gupta.

22 A Thank you.

1 Q Earlier in the deposition, opposing
2 counsel asked you what you had done to prepare
3 for this deposition.

4 Do you recall that line of
5 questioning?

6 A Yes.

7 Q And if I recall correctly, in your
8 response, you identified a paper authored by
9 Dr. Wang in this case; is that correct?

10 A Yes.

11 Q I'm going to introduce as Exhibit --
12 this is 2013.

13 (Exhibit 2013 was marked
14 for identification.)

15 MS. SHOMAKER: I'll object to
16 Exhibit 2013 as outside the scope.

17 BY MR. RACHUBA:

18 Q Dr. Gupta, the paper that I just
19 handed opposing counsel as Exhibit 2013, what
20 is this paper?

21 A This is a paper authored by Hu,
22 Miller, and Dr. Wang, and the title of the

1 paper is "High strain-rate spallation,"
2 S-P-A-L-L-A-T-I-O-N, "and fracture of tungsten
3 by laser-induced stress waves."

4 Q And this is the paper that you had
5 indicated earlier that you had relied on to
6 prepare for this deposition and brought with
7 you to this deposition; is that correct?

8 A Yes.

9 MS. SHOMAKER: Objection, form.

10 BY MR. RACHUBA:

11 Q What is the publication date of this
12 paper?

13 A Appears to be 2009.

14 Q Where do you see that?

15 A That's the very top in the center,
16 Materials Science and Engineering A, which is
17 the name of the journal, the volume is 504,
18 the year is 2009, and the date -- and the
19 pages are 73-80.

20 And there may be an online
21 publication prior to that, but I don't know.

22 Q I see on the first page there's an

1 "ARTICLE INFO" section.

2 Do you see that portion of the
3 paper?

4 A Yes.

5 Q It has a 2008 date.

6 Do you see that?

7 A Yes.

8 Q Is it possible this article was
9 published in 2008?

10 A What it is is that it says it was
11 received, that means when the authors first
12 send the manuscript to the journal, which was
13 on 19th August 2008.

14 Then it was received in revised
15 form, meaning that after the reviewer's
16 comments, and that was received on
17 14 October 2008.

18 And then, finally, the paper was
19 accepted by the journal on 21st October 2008.

20 And after acceptance, some journals
21 can publish it online before it comes in the
22 paper form, which is in 2009.

1 Q Dr. Gupta, you read Petitioner's
2 expert, Dr. Wang's declaration, in connection
3 with this IPR, correct?

4 A Yes.

5 MS. SHOMAKER: Objection, leading
6 scope.

7 And, Counsel, can I just have a
8 standing objection to questions about
9 this document so I don't have to keep
10 chiming in?

11 MR. RACHUBA: On the basis of scope?

12 MS. SHOMAKER: Yes.

13 MR. RACHUBA: Understood.

14 BY MR. RACHUBA:

15 Q And you relied on Petitioner's
16 expert, Dr. Wang's declaration, in drafting
17 your own declaration in connection with this
18 IPR, correct?

19 MS. SHOMAKER: Objection, leading.

20 THE WITNESS: Yes.

21 BY MR. RACHUBA:

22 Q Did Dr. Wang cite this document,

1 Exhibit 2013, in her declaration?

2 A She did not.

3 Q Is that surprising to you?

4 MS. SHOMAKER: Objection, form.

5 THE WITNESS: Yes.

6 BY MR. RACHUBA:

7 Q Why so?

8 MS. SHOMAKER: Same objection.

9 THE WITNESS: As a scientist, she's
10 performing an analysis whether or not the
11 stress wave is modified when it passes
12 through a fused silica substrate, and
13 this particular paper is -- and she has
14 opined in her declaration that the fused
15 silica modifies the stress wave, initial
16 compressive stress wave, with a profile
17 which has an initial ramp up to the peak;
18 and then after the peak, there is a
19 Rayleigh fraction shock, which is
20 essentially a stress dropping down from
21 peak to zero value.

22 She has provided that analysis in

1 her thesis, and then receives a
2 publication she has used, which again
3 repeats what she believes to be true in
4 her thesis.

5 And she has taken the position that
6 the laser-generated stress wave, when it
7 passes through the fused silica, it
8 modifies the stress wave in a fashion
9 that there's initial ramp, and then there
10 is a drop.

11 And then she uses that as a basis to
12 claim that the claims of the '684 patent
13 are anticipated by her thesis and her
14 work. So that's essentially the position
15 she has taken in her declaration.

16 But this particular article, which
17 is authored by her, which was done -- and
18 before I bring this article, in the
19 declaration then, she says that there's a
20 statement of future work in her thesis
21 which basically says that if you arrange
22 the fused silica in the same manner which

1 is taught by the '684 patent, then there
2 will be a modification of the stress wave
3 in the same manner as discussed in her
4 thesis.

5 Now, that future work was not
6 contained in her thesis, but just a
7 statement. She never tried that. And
8 then ultimately she tried that
9 experiment, and that is what her
10 experiment results are indicated in this
11 journal publication, which was several
12 years after.

13 And the results which she is
14 publishing in this paper clearly shows
15 that they are inconsistent with the
16 position or the analysis she had provided
17 in her declaration.

18 And, in fact, it is fully consistent
19 with the analysis I have provided in my
20 declaration, which basically says that
21 she has completely misinterpreted the
22 fringe pattern, and because of that

1 error, interpretation of that fringe
2 pattern, which is, as per my analysis,
3 just a superposition of two waves
4 independently moving past each other, and
5 there's no modification of the
6 compressive stress wave by the fused
7 silica, and I showed that in 1992
8 reference, which Dr. Wang also references
9 in her thesis -- in her declaration, and
10 she claims that's the future work in her
11 thesis, which is the same work which was
12 already done in 1992 by the Gupta 1992
13 paper.

14 In the Gupta 1992 paper, which is my
15 paper, I clearly showed that if you put
16 the fused silica in in the arrangement
17 that Dr. Wang is putting in her future
18 work, the stress wave profiles do not get
19 modified by fused silica. So there is
20 that observation, number one.

21 Then in Dr. Wang's own thesis,
22 there's Figure 3.19, I believe, that's

1 the only figure in the thesis which does
2 not have the influence of the direct
3 tension wave. That's the only figure.
4 Every figure has influence of the direct
5 tension wave.

6 And if you look at that Figure 3.19,
7 it clearly shows that as the stress wave
8 goes through the fused silica, it has
9 initial ramp; and then post-peak, the
10 stress does not fall to -- in a sharper
11 manner. It just has a regular stress
12 wave profile.

13 So that Figure 3.19, for some
14 unknown reason, do not show up in any of
15 the publications which she's using in
16 this IPR which are published. So that
17 figure should have gone to the reviewers,
18 but that figure did not go to -- it did
19 not show up in the -- did not show up in
20 any of the publications which are being
21 used in this IPR by Dr. Wang.

22 Now, there's no modification in the

1 Gupta 1992 paper of the stress wave;
2 there's no modification, as per her own
3 thesis, in Figure 3.19 of her thesis; and
4 in her deposition, she could not explain
5 why you don't see the shock in the
6 Figure 3.19.

7 Finally, we have this paper which
8 she published in 2009, which also shows
9 that if you use silica, fused silica, in
10 the path of the stress wave, the stress
11 wave does not get modified. The
12 post-peak value, or the structure of the
13 stress wave, does not get modified.

14 So the science has remained the same
15 from 1992, in 2000 when she did her
16 thesis, and when she wrote this paper,
17 that the fused silica does not modify the
18 stress wave. It only modified the
19 initial ramp, which goes up, but that
20 does not cause the tension at the
21 interface. It is the post-peak decay,
22 which comes down, which causes the

1 tension at the interface.

2 So basically in this particular
3 paper, and if you look at Figure -- so
4 she did the experiment two ways.

5 So there's the Figure 1, which shows
6 an experimental configuration, which has
7 no fused silica in the path of the stress
8 wave; and then in the inset of the
9 Figure 1, there is an arrangement where
10 she puts the fused silica in the path of
11 the stress wave, modifies that, and then
12 she transmits that into the substrate,
13 and then there's a coating on the other
14 side of the substrate, so she has done
15 both arrangements. So this is really a
16 true guess of whether or not the fused
17 silica acts as a glass element or not.

18 So the results without using the
19 fused silica is shown in Figure 3, and it
20 shows that there's several levels of
21 stresses. So basically she's increasing
22 the laser energy, and she finds that --

1 there are four set of data in her
2 Figure 3, and by different colors. So
3 there's green, blue, red, and black.

4 So these are the profiles of the
5 stress wave she has actually measured
6 when there's no fused silica in the path
7 of the laser-generated stress wave.

8 And it shows -- and she also
9 confirms in her writing that -- so first
10 she confirmed that she used the same
11 experimental procedure which is in the
12 two references she has used in her
13 declaration. So she used the same
14 procedure.

15 And based on her procedure, she
16 finds that the stress wave has a rise
17 time, and it is on page 75 on the second
18 column, it says it can be noticed from
19 Figure 3 that the Gaussian stress wave
20 profiles are slightly deformed with a
21 5 nanosecond loading ramp. That means
22 the rise time of the wave is

1 5 nanoseconds, followed by a stressed
2 10 nanosecond unloading ramp.

3 So the initial wave which it
4 generate due to the laser has a rise time
5 of 5 nanoseconds and a post-peak decay of
6 10 nanoseconds. So that is the stress
7 wave which enters the substrate if you do
8 not use a fused silica.

9 Then she used the fused silica
10 arrangement which is in the inset of
11 Figure 1, and then she provide the
12 results of that testing with the fused
13 silica in on Figure 5 of her paper, and
14 again, there are three set of data over
15 there. One is the blue, one is the red,
16 and one marked by the black.

17 And there you can see the profile of
18 the stress wave, because now it has gone
19 through the fused silica, so that
20 initially there's a ramp.

21 So what was 5 nanosecond rise time,
22 it has now become, according to her, if

1 you read column 2, page 76, when she
2 describes the data obtained from this
3 second arrangement, that the stress
4 profile has a stretched linear loading
5 ramp of about 18 nanoseconds.

6 That means the initial wave of
7 5 nanosecond has now stretched to
8 18 nanosecond, and an unloading ramp of
9 about 10 nanosecond, which is exactly the
10 same post-peak profile which she got
11 without using the fused silica there.

12 And she writes "and an unloading
13 ramp of about 10 ns, which is not as
14 sharp," which is near 1 nanosecond, "as
15 reported in the previous work by Wang,"
16 which is the same paper which she has
17 used in this IPR.

18 So basically what she's finding out
19 is that, in this profile, there's no
20 effect of a tension wave because the
21 constraining layer had been blown off, so
22 there's no tensile stress which has

1 entered the substrate.

2 You see a pure compression wave,
3 which will enter the fused silica, and it
4 comes out of the fused silica, and one
5 finds that you do see the ramp, initial
6 ramp, but the post-peak value is exactly
7 10 nanoseconds, so there's no
8 modification whatsoever.

9 And this is fully consistent with
10 Figure 3.19 of her thesis. That's the
11 only figure in the entire thesis which
12 does not have the influence of a tensile
13 stress.

14 And this is fully consistent with
15 the Gupta 1992 reference, where she
16 claims that arrangement is the same as
17 what she proposed in her future work, and
18 there also, there were no modifications
19 in the stress wave.

20 So this particular conclusion that
21 if you do not have a tension wave which
22 enters the substrate, which apparently

1 entered in every experiment Dr. Wang did
2 except for one data point in her thesis,
3 you do not have a modification.

4 So from the '684 claim, a person
5 skilled in the art would require the
6 modification of the wave, compression
7 wave, basically turning into a ramp,
8 initial ramp, but the most important part
9 is the post-peak value and the post-peak
10 profile has to have a sharper drop, and
11 then the compression wave goes through
12 the substrate, goes through the interface
13 and the compression wave, hits the free
14 surface of the coating, comes back as a
15 tension wave, and then it creates a
16 significant tension up on reflection from
17 the free surface of the coating, and
18 that's what is required by the claim of
19 the '684 patent, claim 1 and claim 13,
20 and that modification in the stress wave
21 is accomplished by a glass element.

22 So in conclusion, the paper by

1 Dr. Wang confirms my analysis, which I
2 have independently done in my report
3 prior to looking at this particular
4 paper, and it is totally -- and it's also
5 consistent with my observation of the
6 1992 Gupta paper, which I discuss in my
7 report in this IPR, and it is completely
8 inconsistent with Dr. Wang's position in
9 the entire declaration.

10 BY MR. RACHUBA:

11 Q Dr. Wang, just -- sorry.

12 Professor Gupta, just to be clear,
13 what is shown on Figure 1 of this document,
14 page 74, is it your opinion that this
15 arrangement depicts the future work described
16 in Dr. Wang's dissertation?

17 A Yes, in the inset figure.

18 Q Is this why Dr. Wang references
19 publication number 28 on the bottom of the
20 first column on page 74, which if you go to
21 the reference listed page, I believe is her
22 dissertation; is that correct?

1 MS. SHOMAKER: Objection to form.

2 THE WITNESS: No. The reference 28
3 would be the article by Wang, Weaver,
4 Sottos, Experimental Mechanics 2002.

5 So I believe there's a reference to
6 this in her declaration.

7 BY MR. RACHUBA:

8 Q Okay. Professor Gupta, are you a
9 lawyer?

10 A No.

11 Q If you became aware of an error in
12 your declaration that you submitted in this
13 IPR, would you take steps to correct that
14 error?

15 A Of course.

16 MR. RACHUBA: No further questions.

17 MS. SHOMAKER: Let's take a quick
18 break to confirm.

19 Can we go off the record?

20 (A break was taken at 1:37 p.m.)

21 (Resume at 1:48 p.m.)

22

1 FURTHER EXAMINATION BY COUNSEL FOR PETITIONER

2 BY MS. SHOMAKER:

3 Q Dr. Gupta, can fused silica ever
4 modify and propagate a stress wave?

5 MR. RACHUBA: Objection, form.

6 Objection, scope. Actually -- okay.

7 THE WITNESS: So the fused silica --
8 I can comment on the fused silica that
9 Dr. Wang used in her thesis, on her
10 papers, and that fused silica did not
11 modify the stress wave in the context of
12 how the '684 patent requires it to be
13 modified.

14 BY MS. SHOMAKER:

15 Q So that's not exactly my question.
16 Can fused silica ever modify and
17 propagate a stress wave?

18 MR. RACHUBA: Objection, form.

19 Objection, scope. Objection, relevance,
20 asked and answered.

21 THE WITNESS: So I can't answer in
22 generality.

1 BY MS. SHOMAKER:

2 Q You can or you can't?

3 A I cannot.

4 Q So as an expert in the field, you
5 can't tell me whether or not fused silica can
6 ever modify and propagate a stress wave?

7 MR. RACHUBA: Objection, form.
8 Objection, mischaracterizes previous
9 testimony.

10 THE WITNESS: Just because I am the
11 expert, I understand what is involved in
12 the modification of the stress wave, and
13 a general question like that, that a
14 fused silica can deform the stress wave
15 in that fashion, I can't answer it until
16 I look at that particular fused silica.

17 BY MS. SHOMAKER:

18 Q So there are circumstances in which
19 fused silica can modify and propagate a stress
20 wave, right?

21 MR. RACHUBA: Objection, form,
22 scope, relevance, foundation,

1 mischaracterizes previous testimony.

2 THE WITNESS: No, I'm not -- I'm not
3 suggesting that either.

4 BY MS. SHOMAKER:

5 Q So is your testimony that fused
6 silica cannot ever modify and propagate a
7 stress wave?

8 MR. RACHUBA: Objection, form,
9 scope, relevance, foundation,
10 mischaracterizes previous testimony.

11 THE WITNESS: I cannot answer a
12 question in general. It depends upon the
13 sample.

14 So all I can say, the fused silica
15 which Dr. Wang used in her thesis, in her
16 papers, which are used in this IPR, the
17 data, that clearly shows that the stress
18 wave did not modify.

19 BY MS. SHOMAKER:

20 Q So are there certain samples of
21 fused silica that can modify and propagate a
22 stress wave?

1 MR. RACHUBA: Objection, form.
2 Objection, scope. Objection, relevance.
3 Objection, foundation.

4 THE WITNESS: I'm not aware of it.

5 BY MS. SHOMAKER:

6 Q But you're not saying there are
7 none, right?

8 A Well, the reason --

9 MR. RACHUBA: Objection, form,
10 scope, relevance, misstates prior
11 testimony.

12 THE WITNESS: The reason I'm not
13 saying a blanket statement, because as a
14 scientist, you have to look at what the
15 structure of the fused silica is, and
16 there are a lot of subtleties in the
17 structure, and that's the reason I'm
18 hesitant in giving a blanket answer.

19 But all I know is that the fused
20 silica which was used by Dr. Wang in her
21 thesis, in her papers, that clearly did
22 not modify the stress wave as required by

1 the '684 patent.

2 MS. SHOMAKER: I have no further
3 questions.

4 MR. RACHUBA: No further questions.

5 (The examination concluded at
6 1:52 p.m.)

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

1 CERTIFICATE OF NOTARY PUBLIC

2 I, DAWN A. JAKUES, a Notary Public in and for
3 the District of Columbia, before whom the foregoing
4 deposition was taken, do hereby certify that witness
5 whose testimony appears in the foregoing pages was
6 duly sworn by me; that the testimony of said witness
7 was taken by me in shorthand at the time and place
8 mentioned in the caption hereof and thereafter
9 reduced to typewriting under my supervision; that
10 said deposition is a true record of the testimony
11 given by said witness; that I am neither counsel
12 for, related to, nor employed by any of the parties
13 to the action in which this deposition is taken;
14 and, further, that I am not a relative or employee
15 of any attorney or counsel employed by the parties
16 thereto, nor financially or otherwise interested in
17 the outcome of the actions.

18 _____
Dawn A. Jaques, CSR, CLR
19 Notary Public in and for
20 the District of Columbia

21 My commission expires:
22 February 28, 2030

1 Professor Vijay Gupta, c/o

2 SUGHRUE MION PLLC

3 2000 Pennsylvania Avenue, NW, Suite 9000

Washington, D.C. 20037-1811

4

Case: The Boeing Company v. The Regents of the University of California

5 Date of deposition: April 11, 2025

6 Deponent: Professor Vijay Gupta

7

8 Please be advised that the transcript in the above
referenced matter is now complete and ready for signature.

9 The deponent may come to this office to sign the transcript,

10 a copy may be purchased for the witness to review and sign,

11 or the deponent and/or counsel may waive the option of

12 signing. Please advise us of the option selected.

13 Please forward the errata sheet and the original signed

14 signature page to counsel noticing the deposition, noting the

15 applicable time period allowed for such by the governing

16 Rules of Procedure. If you have any questions, please do

17 not hesitate to call our office at (202)-232-0646.

18

19 Sincerely,

20 Digital Evidence Group

21 Copyright 2025 Digital Evidence Group

Copying is forbidden, including electronically, absent

22 express written consent.

1

2

Digital Evidence Group, L.L.C.

3

1730 M Street, NW, Suite 812

4

Washington, D.C. 20036

5

(202) 232-0646

6

7

SIGNATURE PAGE

8

Case: The Boeing Company v. The Regents of the University of California

9

Witness Name: Professor Vijay Gupta

10

Deposition Date: April 11, 2025

11

I do hereby acknowledge that I have read

12

and examined the foregoing pages

of the transcript of my deposition and that:

13

14

(Check appropriate box):

() The same is a true, correct and

15

complete transcription of the answers given by
me to the questions therein recorded.

16

() Except for the changes noted in the

attached Errata Sheet, the same is a true,

17

correct and complete transcription of the

answers given by me to the questions therein

18

recorded.

19

DATE

WITNESS SIGNATURE

20

21

DATE

NOTARY

22

1 Digital Evidence Group, LLC
2 1730 M Street, NW, Suite 812
3 Washington, D.C. 20036
4 (202) 232-0646
5

6 ERRATA SHEET
7

8 Case: The Boeing Company v. The Regents of the University of California
9 Witness Name: Professor Vijay Gupta
10 Deposition Date: April 11, 2025

11 Page No. Line No. Change
12
13
14
15
16
17
18
19
20

21 _____
22 Signature Date

A	admit 14:21	38:21 39:7,10	128:14	56:14,14,18
a.m 1:19 2:7	advice 65:8	39:22 40:3,8	approximately	57:13 63:10
58:13,16 61:2	advise 127:12	40:10 42:14	11:1	65:8 66:1,2
61:3 70:20,22	advised 127:8	48:15 49:9,17	April 1:18 2:6	78:22 89:18
83:5,6 96:19	advisor 16:21	52:7 57:6,7	127:5 128:10	91:15,19 92:3
able 79:15	17:4	58:5,7,22	129:10	98:10
100:13	affiliated 10:21	62:10 63:11	area 53:4	aspect 13:4
absent 127:21	age 61:14 63:8	71:18 72:3,21	areas 68:10	15:12 29:3,14
academic 16:19	agencies 68:21	73:5 76:22	79:13	31:1 37:6
62:17	agreement 52:11	77:17 81:2,5	arrange 108:21	74:22
academics 16:10	ajairam@mck...	81:18,22 82:13	arrangement	aspects 14:6
16:15	3:17	82:16,22 86:1	12:4 110:16	29:10,16 41:17
acceptance	al 5:15	88:17 89:12,20	113:9 115:10	50:9
105:20	allegedly 99:10	90:4 91:7,12	116:3 117:16	asserted 33:20
accepted 105:19	allowed 24:1	91:21 94:14,22	119:15	assertion 18:22
access 54:7	127:15	95:16,19 96:9	arrangements	assignment 45:8
accommodate	amorphous 86:3	96:14 97:10	113:15	Assistant 64:14
72:4	87:14	100:4,8 101:2	art 59:8,13,21	associated 27:5
accomplished	amount 24:2	121:21 122:15	60:1 74:1	association 70:5
118:21	Amy 3:22 19:16	123:11 124:18	90:17,21 118:5	assuming 62:4
accomplishme...	21:12 76:2	answered 22:9	article 5:15 9:19	86:20
67:19	analysis 13:2	33:2 38:1,3,7	10:1 11:22	attached 44:8
accurate 62:9	14:14 30:8	38:16,18 39:1	12:2,8,11,13	128:16
acknowledge	40:21 41:15,18	40:1,6 41:10	12:17,19 13:8	attend 48:12
128:11	41:20 54:12,17	50:2 51:1	54:3,8,11,16	49:7
acknowledged	73:2 82:19	52:12,20 72:6	55:9,13,21	attended 13:21
63:19 64:10	89:18 91:6,11	78:13 79:4	56:6,19 105:1	48:2 49:14
acquainted 17:7	92:8,12,12	80:7 121:20	105:8 108:16	attorney 126:15
act 93:21	93:12,18 94:1	answering 77:6	108:18 120:3	attorney-client
action 18:20	94:12 95:3,6	answers 56:20	articles 10:3	100:5
126:13	95:18,22 97:12	128:15,17	30:2	attorneys 27:21
actions 126:17	99:1 100:7	anticipated	artificially 85:10	attorneys' 1:13
acts 113:17	107:10,22	108:13	Arvind 3:12 7:6	21:4 71:22
add 11:18 36:18	109:16,19	anybody 28:16	asked 22:8 33:1	August 105:13
adding 55:21	110:2 119:1	74:3	37:22 38:6,15	authored 9:21
addition 15:14	analyzed 45:2	apparently	38:22 39:5	103:8,21
additional 54:2	analyzing 43:7	117:22	40:5 41:9 50:1	108:17
94:13 95:5,22	43:12 53:6	APPEAL 1:2	50:22 62:20	authors 105:11
98:15	54:19	APPEARANC...	78:13,16 79:2	Avenue 2:9 4:6
address 8:2	and/or 127:11	3:1 4:1	79:6,6,11,19	127:3
adhesion 65:9	announce 19:15	appears 14:19	79:22 80:3,3,5	avoid 77:5
adhesion-relat...	answer 9:11	104:13 126:5	80:6,8,14 83:1	aware 16:11
65:9	13:15 17:17	applicable	87:9 92:11	17:11 23:6
adhesive 95:8	25:22 27:12,18	127:15	103:2 121:20	28:10 31:18,21
administered	27:22 28:4,6,9	appreciate 29:9	asking 21:6	32:7,20 36:8
7:2	32:14 34:13	29:15,17 41:17	32:15,19 39:13	78:17 120:11
	36:7 38:5,19	appropriate	46:11,17 55:22	124:4

B	119:21 120:5	call 47:4 127:17	circumstances	Columbia 2:12
back 16:4 21:14	believes 108:3	called 2:4 7:13	122:18	126:3,20
25:6 58:17	benefit 34:4	calling 65:8,21	cite 12:13	column 114:18
61:5 71:5 83:8	best 45:20 61:20	calls 48:15 96:13	106:22	116:1 119:20
83:20 98:3	62:10	candor 8:15	cited 43:21	come 21:14 24:9
102:1,21	bit 50:10	capacity 46:22	53:18,20,21,22	41:18 62:6
118:14	black 55:5 114:3	caption 126:8	54:2,3	63:3 66:1 68:3
bad 30:15	115:16	career 68:2	claim 60:4,8,16	74:16 99:12
based 15:7 28:8	blanket 124:13	case 62:12,13	73:9 108:12	101:6,13 127:9
29:22 30:11	124:18	98:16 103:9	118:4,18,19,19	comes 24:18
36:19 40:21	blown 116:21	127:4 128:8	claims 34:20	30:18 62:22
41:12,19 45:2	blue 114:3	129:8	36:12 37:13,15	105:21 112:22
59:7,22 64:6	115:15	Casey 3:4 7:4	37:21 38:14	117:4 118:14
65:3,17,17	BOARD 1:2	cause 112:20	41:8 57:20	comfortable
66:14 82:7,12	Boeing 1:4 3:21	causes 112:22	59:6 72:16	72:7
90:10,13,19	3:22 18:18	caution 9:8 70:8	73:14 88:21	coming 24:10
93:19 98:19	19:16 33:21	72:20 82:5	108:12 110:10	commencing 2:6
101:13 114:15	34:6 65:7	93:10,14 94:8	117:16	comment 28:8
bases 13:3	68:17 127:4	94:20 95:14	clarify 25:14	121:8
basically 12:6	128:8 129:8	96:7 97:8	84:4	commentary
43:9 53:11	Boeing's 21:8	100:3	clear 51:20 67:3	77:14
54:12 84:9	70:11 71:19	center 104:15	77:17 80:11,17	comments 11:15
108:21 109:20	bottom 68:7	certain 88:16	80:19 119:12	105:16
113:2,21	119:19	98:10 123:20	clearly 12:9	commercial
116:18 118:7	box 128:14	certainly 36:21	16:20 41:1	69:6,10,13
basis 24:19 44:1	break 8:21,22	37:17 75:11	109:14 110:15	74:5
48:17 49:18	46:19 58:13	CERTIFICATE	111:7 123:17	commission
56:7,13 62:14	61:1,2,9 77:21	126:1	124:21	126:21
64:8 66:4,6,21	78:3,13 79:1	certify 126:4	client 7:6	committee 64:18
67:2,3 77:5	79:20 83:4,5	challenged	clients 26:15	64:22
91:11 100:7	96:15,19 97:22	34:20 36:12	CLR 2:10	common 68:6
106:11 108:11	98:5,9 102:11	37:13,21 38:13	126:18	communicate
beginning 88:8	102:13,17	39:21 41:8	co-counsel 76:11	66:15
begun 48:6	120:18,20	Change 129:11	co-inventor	communication
behalf 3:2 4:2	breaks 9:4	changes 128:16	83:10	35:20
believe 11:14	brief 96:15	charge 24:9	coating 113:13	communicatio...
14:5 15:11,14	bring 25:6	26:15	118:14,17	27:21 28:2
21:4,8 25:18	108:18	Check 128:14	coinventor	82:7
35:7 36:16	brought 42:1	checked 44:10	60:16	community 64:4
38:17 41:22	104:6	checks 27:4	collaborate	64:6
45:6,20 46:9		chemical 84:12	83:12	companies 65:8
53:15 57:3	C	chiming 106:10	collaboration	65:10,20 68:16
60:18,20 71:15	C 7:1	China 65:22	74:15	68:18 74:11
78:4,16 80:21	c/o 127:1	chips 74:21	colleague 7:6	75:10 78:5,6
92:7 98:14	California 1:7	chose 74:16	collected 54:19	78:17 80:20
101:22 110:22	8:4 127:4	circles 16:20	College 74:17	82:1
	128:8 129:8	62:17 65:14	colors 114:2	Company 1:4

18:18 127:4 128:8 129:8 compensation 23:15 complete 127:8 128:15,17 completely 12:10 43:10 45:12 55:7 109:21 119:7 component 30:16 composite 94:16 composition 84:12 compression 54:13 117:2 118:6,11,13 compressive 107:16 110:6 concept 16:3 concluded 125:5 conclusion 41:4 41:19 101:6,13 117:20 118:22 conditions 89:11 conferences 62:18 66:2 67:20 confidential 1:13 6:10 9:9 19:3 21:4,17 70:9 71:22 76:14 confidentiality 71:17 76:18 77:3 78:9 confidentially 76:16 configuration 113:6 confirm 16:14 94:2 120:18 confirmation 15:9 confirmed 114:10	confirms 12:3 54:12 114:9 119:1 connection 18:16 19:19 106:2,17 connotation 32:10 consent 127:22 consider 15:17 30:10 59:11,17 consideration 49:15 considered 27:9 27:17 87:1 99:12 consistent 37:9 40:18 109:18 117:9,14 119:5 constraining 116:21 construction 73:9 consult 58:14 96:20 consultant 23:20 24:13 consulting 24:1 24:6,8,12 26:14 64:7 contacted 25:15 contained 109:6 contents 98:6 context 16:19 37:14 40:13 43:8 67:5 73:20 86:16,18 87:6 89:6 91:1 91:19 93:2,7 94:5,17 95:9 96:4 97:5 99:21 121:11 continue 50:13 54:15 continued 4:1 6:1 75:1 continuing 68:8	continuously 54:21 contradicted 12:11 contradicts 12:6 contributed 83:17,18 control 20:21 21:19 22:1,14 conversation 60:7 63:2 conversations 10:9,12 11:2 57:17 60:15 63:1 93:13 copy 10:1 18:15 42:1 127:10 Copying 127:21 Copyright 127:21 Corporation 65:6 70:3 correct 8:15 13:22 18:22 20:4,5,7,8 22:21 23:14 24:16 29:2 33:18 35:5 36:3 42:2 44:2 44:6 47:18 48:3,8 49:8 52:12 53:19 54:5 67:13 83:22 84:1 91:15 92:19 98:18 103:9 104:7 106:3,18 119:22 120:13 128:14,17 correctly 103:7 counsel 2:5 3:22 7:17 9:4,16 10:10 11:2 19:1,19,22 21:8 25:5,6 28:3 31:7 35:13,21 38:3	38:9 39:2,5,18 45:17 46:4,14 46:21 47:7,12 47:17 48:6,10 48:11 49:1,16 50:8,15,20 51:9,18 55:21 57:2,14,22 58:2,14 59:2 60:3,8 61:7 67:2 70:11 71:20 77:14,15 77:19 79:6,13 81:12 82:8 88:6 90:3 91:7 93:13 96:20 97:17 98:7 102:19 103:2 103:19 106:7 121:1 126:11 126:15 127:11 127:14 counsel's 13:19 49:13 countries 66:1 course 33:9 36:14 53:20 63:15 76:1 120:15 court 3:5 20:4 33:21 70:13 covers 10:6 created 69:13 70:4 72:9 creates 118:15 Crescent 3:5 critical 31:12,22 32:4,8,12,21 88:7 crystalline 84:10 crystals 85:9 cshomaker@... 3:9 CSR 2:10 126:18 currently 71:2 CV 44:8	D D 7:1 D.C 1:21 2:9 3:15 4:8 127:3 128:4 129:3 Dallas 3:7 Dartmouth 74:17 data 13:3 30:19 54:19 64:17,21 65:12 114:1 115:14 116:2 118:2 123:17 date 25:17 50:18 104:11,18 105:5 127:5 128:10,19,22 129:10,22 dates 46:6 David 3:21 7:7 Dawn 2:10 126:2,18 day 9:18 11:6 24:1 Daylight 1:19 dean 62:2 decay 112:21 115:5 decision 41:12 49:13 decisions 20:22 21:20 22:1 declaration 6:6 9:13,14 11:8 11:12 12:7,10 12:14,20 13:1 13:11 16:22 24:20 30:22 42:1,12,18,20 42:21 43:8,11 43:18,21 44:1 44:6,9,15,20 44:22 45:13,16 46:10,12 52:14 52:19 53:9,16 53:18,19 55:8
--	--	--	--	--

55:14 56:5	describe 88:2,11	19:11 57:21	61:5,13 71:2	127:21
61:12 63:14	100:10,18	60:6 66:20	71:14 76:12	element 87:19
66:9 67:7	described	70:21 76:9	77:8,16 78:3	87:22 88:1,10
72:19 91:21	101:10 119:15	92:7	78:20 80:20	89:3,15 90:8
92:1,5,6,14,16	describes 116:2	discussions 47:6	83:8 90:6	90:22 92:9,18
101:17 102:7	description	47:11,16 50:15	91:14 92:16	93:2,7,21 94:4
106:2,16,17	90:14,19 98:19	51:14 60:13	98:3 101:16	94:17 95:9
107:1,14	designate 21:16	61:6	102:6 103:9,18	96:3 97:4
108:15,19	designated 19:2	disordered 85:3	103:22 106:1,2	98:11 99:21
109:17,20	76:13	85:12 86:4	106:16,22	100:16 101:7,8
110:9 114:13	DESIGNATI...	disseminated	110:8,17,21	101:13 113:17
119:9 120:6,12	6:10	68:10 69:4	111:21 118:1	118:21
default 77:20	detailed 99:6	dissertation	119:1,8,11,16	elements 97:14
define 60:1	details 29:12	119:16,22	119:18 121:3,9	98:10 99:14,20
definition 87:9	88:18 89:9	distinguish	123:15 124:20	EMAT 96:2
deform 93:21	determine 26:12	37:11	draft 52:13	97:3
122:14	41:7 98:16	district 2:11	drafting 106:16	embarrassing
deformed	100:20	20:4 33:21	drew 16:16	66:19
114:20	determining	70:13 126:3,20	drop 21:12	embodies 69:14
deforms 89:10	59:12	document 18:9	108:10 118:10	embodiment
depends 29:3	developing 53:3	106:9,22	dropping 76:3	69:6,10,14
31:1 84:16,18	development	119:13	107:20	74:5
86:15 123:12	15:21 74:18	documents 52:3	due 115:4	employed 23:10
depicts 119:15	different 29:9,16	53:8 54:1	duly 7:14 126:6	23:12 126:12
depo 48:12	79:13 85:9	doing 13:2 24:11	duty 8:15	126:15
deponent 127:6	114:2	54:16 89:20		employee 20:10
127:9,11	Digital 1:20	95:5,20	E	20:13 126:14
deposed 20:3,6,9	127:20,21	domain 62:18	E 7:1,1	employment
deposition 1:16	128:2 129:1	Dr 6:6 7:19 9:21	E-M-A-T 96:3	23:16,22
2:1 5:9 9:7	direct 27:5	10:5 11:8 12:1	97:4	energy 113:22
10:4,7 11:9	111:2,4	12:4,11 13:10	E-X-H-I-B-I...	engage 100:19
12:16 13:7,22	directed 31:3	13:18,21 14:3	5:7	engaged 25:3,12
14:3,6 18:16	directly 12:6	14:9,16 15:2	EA9394 89:14	25:14 49:1,20
18:21 19:1,19	24:7,9 64:15	16:4,11,16	90:22 93:6	50:6
43:1 44:5 48:2	disagree 77:5	17:5,8,10 18:4	earlier 9:17 10:2	engagement
49:7,15,22	disclose 75:20	18:7,20 19:18	11:3 38:19	25:19 52:10
50:21 51:12,13	81:10	28:7 29:20	43:2 44:21	Engineering
57:11 70:14	disclosed 29:6	30:1 31:3,4,12	51:12 52:12,20	5:14 104:16
77:6,10 79:21	70:13 75:5	31:12 32:21,21	78:10 103:1	engineers 70:5
92:4 101:18	79:3	33:5 36:11,16	104:5	72:10
103:1,3 104:6	discuss 9:3 54:9	40:4 41:16,22	Eastern 1:19	enter 117:3
104:7 112:4	98:6 100:14	42:9,22 43:1,9	effect 55:3	entered 117:1
126:4,10,13	119:6	43:10,15 44:8	116:20	118:1
127:5,14	discussed 51:12	45:10 48:3,12	either 31:20	enters 115:7
128:10,12	109:3	49:7,20,22	86:6 99:3	117:22
129:10	discussing 63:3	50:21 54:3,18	123:3	entire 12:10
deposits 27:5	discussion 9:15	55:8 60:21	electronically	54:17 55:8

72:8 117:11 119:9 entirety 12:7 entities 23:7 66:10 entitled 34:11 entity 24:11 epoxies 91:22 epoxy 88:20 89:3,10,14 90:22 92:8 93:6 equivalent 85:16 87:2 errata 127:13 128:16 129:6 error 30:21 110:1 120:11 120:14 errors 30:5 41:15 54:18 101:16 102:4 Esq 3:4,12 4:4,5 essentially 12:2 36:19 44:12 54:17 86:3 101:9 107:20 108:14 establish 97:16 et 5:15 European 66:1 evaluated 37:13 40:13 evaluation 67:10 Evidence 1:20 127:20,21 128:2 129:1 exact 25:17 46:6 48:9 exactly 50:8,11 50:18 51:3 56:2 80:3 86:22 116:9 117:6 121:15 examination 2:4 5:4,5 7:17 102:19 121:1	125:5 examined 7:15 128:12 example 30:14 examples 68:15 exclusive 22:20 excuse 35:13 39:17 76:14,17 exercise 8:14 Exhibit 5:8,9,12 5:13 6:4,5 17:21 18:1,5 18:13 42:8 103:11,13,16 103:19 107:1 exhibits 6:3 9:13 42:19 expectation 35:9 experience 53:3 53:21 experiment 109:9,10 113:4 118:1 experimental 113:6 114:11 120:4 experimentalist 63:20 64:11 66:12 67:13,16 experimentati... 99:5 101:8 experiments 55:2 100:19 101:5 expert 20:7 24:16 25:16 26:8 28:16,19 28:20,21 30:11 31:4 34:19,21 34:22 35:3 37:12 44:21 46:17,20 49:21 50:9,11,16 51:17 52:4 67:8,10 106:2 106:16 122:4 122:11	expert's 67:7,8 experts 27:8,16 28:10 expires 126:21 explain 112:4 express 127:22 expressed 24:20 extent 21:6 26:1 28:1 30:7 34:13,22 35:8 36:5 39:12 42:14 71:8,15 72:6,11,21 75:1 76:12,20 81:2 82:10 89:17,22 91:5 93:11 94:10,22 95:16 96:9,12 97:10 100:4,9 101:1 extra 98:20,21 eyes 1:13 21:4 72:1 F face 67:19 fact 20:3,9 109:18 fall 111:10 familiar 18:4 famous 66:17,18 fashion 100:14 108:8 122:15 February 126:22 fee 24:9 feel 18:5 72:7 76:20 fees 35:4,6,10,12 35:15,18 36:2 fiberglass 94:4 field 15:18 28:11 28:17 63:20 65:1 66:18 67:9,11,17 122:4 figure 110:22	111:1,3,4,6,13 111:17,18 112:3,6 113:3 113:5,9,19 114:2,19 115:11,13 117:10,11 119:13,17 filed 70:14 filing 40:20 final 99:12 finally 105:18 112:7 financial 33:16 financially 33:7 126:16 find 30:4 36:12 37:2,20 38:13 45:10 finding 116:18 finds 34:19 55:2 113:22 114:16 117:5 fine 96:17 97:20 firm 26:18,19 35:8,9 first 7:14 16:1,6 25:3,12,15 42:18 46:3 52:21 64:13 96:14 104:22 105:11 114:9 119:20 five 39:6,7 five-minute 83:4 fix 30:15 flip 18:5 focus 14:13 44:21 63:1 focused 13:1,4 45:5 follow 13:18 followed 14:16 115:1 follows 7:16 forbidden 127:21	foregoing 126:3 126:5 128:12 form 11:13,20 12:21 13:13 14:4,11,18 15:4,19 17:13 18:14 28:12,18 29:7,21 31:14 34:1 36:13 39:3 43:22 44:16 46:15 51:8 69:8,18 74:6 75:6,14 76:4 78:7 80:22 82:15 84:3,8,10,14 84:22 85:6,12 85:18 86:3,4,7 86:14 87:5,11 87:14 88:15,22 89:4,16 90:12 91:2,16 92:20 93:8 94:6,18 95:11 96:5 97:6 100:1,22 101:19 104:9 105:15,22 107:4 120:1 121:5,18 122:7 122:21 123:8 124:1,9 formal 25:19 formed 64:18 forming 59:18 forward 127:13 found 30:20 34:6 63:12 foundation 15:5 17:14 31:8,15 33:22 44:17 53:6 74:7 75:7 75:15 76:5 78:8 91:17 95:13 96:6 97:7 122:22 123:9 124:3 four 114:1
---	--	--	---	--

fraction 107:19	gain 57:19 59:5	36:18 40:9	110:12,14	idea 23:4,9 34:9
fracture 5:17	gained 28:1	48:14 51:14	112:1 117:15	34:16 35:19
43:5 104:2	Gaussian 114:19	54:9 55:11	119:6,12 120:8	identical 86:22
frame 71:6	general 28:15,21	58:4 64:20	121:3 127:1,6	identification
frankly 71:6	46:17 87:8	70:8 71:16	128:9 129:9	18:2 103:14
free 18:5 118:13	99:13 122:13	72:17,20 73:3	Gupta's 58:21	identified 103:8
118:17	123:12	79:12,16,17	guy 66:17	II 4:4
Friday 1:18 2:6	generality	82:5 89:19	guys 58:8	imagine 29:8
fringe 109:22	121:22	91:4 93:14		65:21
110:1	generally 14:10	103:11	H	impact 65:15
front 19:20	generate 115:4	good 7:19,20	H-Y-S-O-L 93:6	important 118:8
full 7:21 61:15	give 17:16 64:19	60:22 97:18	half 9:18 11:6	improve 15:3
62:21 63:7	66:1,3 68:19	govern 37:15	handed 103:19	improvement
64:15	88:18	40:14	happen 74:22	15:8
fully 109:18	given 39:7 50:8	governing	heard 28:8	impurities 84:18
117:9,14	66:7,7 99:13	127:15	held 2:7 19:11	86:21 87:15
fundamental	126:11 128:15	government	70:21 76:9	in-house 3:22
53:1	128:17	68:21	hereof 126:8	71:19
further 120:16	giving 124:18	governs 41:3	hesitant 124:18	In-Person 2:1
121:1 125:2,4	glass 87:4,9,10	great 67:19 68:5	hesitate 127:17	included 69:5
126:14	87:13,19,20,21	green 114:3	high 5:16 42:9	includes 87:19
fused 54:14 85:5	87:22 88:1,10	Greenleaf 8:3	43:4 77:17	including 68:17
85:8,13,15,16	88:20 89:3,14	group 1:20 16:6	85:11 104:1	127:21
85:17 86:2,12	90:8,22 92:8	127:20,21	highly 1:13 45:8	inconsistent
86:12 107:12	92:17 93:2,6	128:2 129:1	45:11 71:22	109:15 119:8
107:14 108:7	93:21 94:4,16	guess 35:8 47:3	hired 35:7 48:19	increasing
108:22 110:6	95:9 96:3 97:4	113:16	48:22 50:11	113:21
110:16,19	97:14 98:11	Gupta 1:17 2:3	51:16 52:4	independent
111:8 112:9,17	99:21 100:15	5:3,10 6:6 7:12	62:3 64:14	35:1 73:4
113:7,10,16,19	101:7,12	7:19 8:1 13:10	65:4	82:11 90:1,7
114:6 115:8,9	113:17 118:21	13:18 17:15	history 15:21	91:10 93:20
115:12,19	gleaned 27:20	18:4,7,20	59:10,16,19	94:11 100:6
116:11 117:3,4	go 19:9 30:9	19:18 28:7	73:21 90:15,20	independently
121:3,7,8,10	58:12,17 62:1	33:5 36:11,16	Hitachi 65:6	63:6 110:4
121:16 122:5	62:18 68:5	40:4 41:22	hits 118:13	119:2
122:14,16,19	70:17 76:6	42:9 43:15	home 8:2	INDEX 6:1
123:5,14,21	97:21 102:1,15	49:20 60:21	honest 8:12,19	India 65:22
124:15,19	111:18 119:20	61:5,13 71:2	hour 8:22 9:16	indicated 104:5
future 12:5 98:7	120:19	71:14 76:12	11:4 26:11	109:10
108:20 109:5	goes 30:15 111:8	77:8,16 78:3	79:20	indicates 99:20
110:10,17	112:19 118:11	78:20 80:20	Hu 103:21	industry 64:7
117:17 119:15	118:12	83:8 90:6	Hysol 89:14	74:4
	going 9:8 13:14	91:14 92:16	90:22 92:8	influence 111:2
G	13:18 14:13	95:1 96:10	93:5	111:4 117:12
G 7:1	17:19 21:2	98:3 101:16	I	INFO 105:1
Gaffney 3:22	25:21 27:10,11	102:6,21	I-N-D-E-X 5:1	information
19:16	28:3 31:7	103:18 106:1		9:10 13:16

26:2 27:13 34:14 36:6 42:10,16 48:16 49:10 70:10 72:22 81:3,11 82:12 89:21 91:9 93:16,17 94:9,21 95:15 96:8,11,13 97:9 101:3 informed 47:5 60:3 infringe 34:6 90:2 infringement 73:1,8 89:18 91:6,11,15 92:12 93:11,15 93:17 94:12 95:2,18 97:12 100:7 infringing 99:10 initial 107:15,17 108:9 111:9 112:19 115:3 116:6 117:5 118:8 initially 115:20 inquiry 36:20 inset 113:8 115:10 119:17 inside 70:5 72:9 inspiration 16:17,19 instantly 95:21 instituted 25:18 46:1 51:16 institution 45:19 46:8 47:5,12 47:18 instruct 13:14 25:21 27:10,12 28:3 48:14 89:19 91:4 instructing 49:17 instruction	13:19 77:7 78:9 80:10 Instruments 65:6 integrated 11:15 14:6 Intel 65:5 70:3,6 71:3,10 72:9 72:15 73:10 intellectually 33:9 intent 92:3 interact 75:10 interactions 64:4 interchangeably 86:13,19,20 interest 17:1 33:5,12,14,16 interested 126:16 interface 15:13 112:21 113:1 118:12 intermittently 53:22 internal 74:19 interpretation 30:5,19 110:1 intricacies 21:7 introduce 17:20 103:11 invention 33:10 inventor 33:8 37:19 38:12,18 39:14,19,20 40:18,19 73:15 83:21 invited 66:2,3 68:18,22 involve 101:9 involved 18:21 49:15 122:11 IPR 13:12 20:1 24:16 25:4,13 25:16,20 26:8 27:6,9 33:6,15	33:17,20 34:19 35:2,4 39:21 45:22 46:5,14 46:21 47:5,12 47:17 48:7,10 50:12 51:15 52:5 53:7 77:21 92:5 106:3,18 111:16,21 116:17 119:7 120:13 123:16 IPR2024-00761 1:10 irrelevant 94:11 issue 33:20 J Jairam 7:6 19:5 19:9 Jairman 3:12 Japan 65:22 Jaques 2:10 126:2,18 jeopardy 76:22 joined 19:16 journal 104:17 105:12,19 109:11 journals 68:15 105:20 judge 8:7 Junlan 5:15 jury 8:7 K K 3:13 K-I-R-E-E-V 33:11 keep 25:8 106:9 kind 53:22 55:15 kindly 59:3 78:12 80:2 Kireev 33:10 83:11,13 know 9:1 16:18 17:10 21:13	23:2,3 26:22 27:8,16 31:6 31:11,16 32:17 33:3 34:10 44:7,10 50:11 61:19 68:3 72:3 73:10 74:8,10 76:12 78:22 91:19 92:2,10,13 99:3 104:21 124:19 know-how 28:22 knowing 89:11 knowledge 27:1 27:19 28:2 61:20 62:11,19 73:5,8,13 known 65:13 knows 27:15 Korea 65:22 L L 3:4 4:4 L.L.C 128:2 lab 74:16,19 laser 15:18,21 16:2,7 17:1 18:17 28:11,17 30:14,15 33:13 69:11,19 72:8 75:9 113:22 115:4 laser-generated 108:6 114:7 laser-induced 5:18 43:6 104:3 law 2:7 26:18,19 35:7,9 lawyer 120:9 layer 116:21 leader 15:17 leaders 65:1,2 leading 63:19 64:11 66:12 67:12,16 68:14	106:5,19 leave 21:11 led 83:13 legal 28:21 let's 46:19 64:13 67:3 76:6 79:14 80:19 83:3 96:15 102:11,12,15 120:17 letter 25:20 letters 63:9 65:2 level 42:9 77:17 86:21 levels 113:20 license 23:7 licensee 22:5,18 22:20 23:3 33:13 limit 39:3 limitation 98:11 limitations 92:18 line 6:11 21:3,9 25:7 55:18 56:16,22 70:10 71:20 72:18 103:4 129:11 linear 116:4 listed 44:7 53:14 66:11 119:21 listen 58:5 96:14 litigation 18:17 51:11 little 50:10 LLC 129:1 loading 114:21 116:4 located 44:14 70:2 lodge 31:8 logistical 19:6 long 11:1 83:19 look 32:4 43:17 63:17 77:20 78:21 89:9 99:8 111:6
--	---	---	--	---

113:3 122:16 124:14 looked 31:20 looking 13:6 26:3 47:9 62:2 99:5 101:11 119:3 looks 64:18 lot 11:14 15:8 65:22 66:13 67:18 68:1,4 84:17 124:16 lrachuba@sug... 4:11 LST 10:21 20:10 20:14,17,22 21:8,20 22:1,3 22:5,7,14,20 23:13,18,19 24:3,5,7,8,10 24:11 27:2 34:5 35:11,14 51:10 lunch 97:18,22	74:20 86:22 88:2,11 100:11 100:20 104:16 matter 127:8 matters 50:16 maximum 72:12 McKOOL 3:3 3:11 mean 14:12 23:2 23:21 44:18 47:6 51:7 62:22 64:1 66:15 67:22 68:13,14 71:12 91:18 meaning 57:20 59:6,15,22 60:4,8,16 73:14,20 88:21 89:15 90:7 105:15 means 16:19 105:11 114:21 116:6 measure 65:9 measured 15:12 114:5 mechanics 29:13 45:4 52:22,22 63:21 67:17 120:4 medical 8:17 meet 68:1 memorialize 52:4 memorializing 25:20 mentioned 10:9 11:3 43:2 44:21 51:6 126:8 merit 36:19 met 16:21 17:9 62:21 68:1 micron 101:22 middle 63:18 Miller 103:22	mind 75:21 76:3 85:22 minute 19:10 96:15 minutes 102:13 Mion 2:8 4:3 127:2 Miranda 3:21 7:7 21:11 76:1 mischaracteri... 23:1 122:8 123:1,10 mischaracteri... 22:16 misinterpreted 109:21 missed 88:6 misstates 32:1 37:3 47:19 60:10 81:14 92:21 124:10 misunderstood 59:1 modification 54:13 55:4 109:2 110:5 111:22 112:2 117:8 118:3,6 118:20 122:12 modifications 117:18 modified 12:3 88:16 99:2 107:11 110:19 112:11,13,18 121:13 modifies 107:15 108:8 113:11 modify 100:13 100:21 112:17 121:4,11,16 122:6,19 123:6 123:18,21 124:22 modifying 88:3 88:12 module 25:9	moment 17:16 morning 7:19,20 motivated 15:2 moving 110:4 N N 4:5 7:1 name 7:21 40:12 64:12 83:10 104:17 128:9 129:9 named 33:8 names 64:12 Nancy 29:20 nanosecond 114:21 115:2 115:21 116:7,8 116:9,14 nanoseconds 115:1,5,6 116:5 117:7 NDA 71:3 near 116:14 necessarily 76:17 need 8:22 21:9 40:7 76:22 77:8 98:22 100:19 needed 24:4 needs 39:22 neither 126:11 never 60:7 109:7 new 11:22 43:12 Notary 2:11 7:14 126:1,2 126:19 128:22 noted 71:22 128:16 notes 42:4 notice 2:5 noticed 101:17 114:18 noticing 127:14 noting 127:14 ns 116:13 number 6:4	110:20 119:19 NW 1:21 2:9 3:13 4:6 127:3 128:3 129:2 O O 7:1 Oaks 8:4 oath 7:2 8:6 object 55:15 72:17 85:1,1 103:15 objecting 55:17 56:15 57:6 82:14 objection 11:13 11:20 12:21 13:13 14:4,11 14:18 15:4,19 17:13,17 18:14 21:2 22:8,15 22:22 28:12,18 29:7,21 31:8 31:14 32:1,9 33:1,22 34:12 36:4,13 37:3 37:22 38:6,15 38:22 39:1 40:5 41:9 42:13 44:16 46:15 47:1,13 47:19 48:13,18 50:1,22 51:8 52:6 55:12 56:8,13,22 58:3,6,21 60:10 69:8,18 73:18 74:6,7,7 75:6,14 76:11 77:13 78:7 80:22 81:14 84:3,8,14,22 85:6,18 86:6,8 86:14 87:5,11 88:15,22 89:4 89:16 90:12 91:2,3,3,16
--	--	---	---	--

92:20,21,21	online 104:20	P	10:11	92:18 93:3,7
93:8,9,9 94:6,7	105:21	P 7:1	particular 12:2	94:5,17 95:10
94:7,18,19,19	opined 107:14	P.C 3:3,11	34:22 45:8	96:4 97:5
95:11,12,12,13	opinion 39:13,19	p.m 96:22 97:22	51:22 53:7	98:12 99:22
96:5 97:6	67:1,7,8 91:15	98:1 102:17,18	54:2,8 79:22	100:10,15
99:16 100:1,22	94:11 95:5,21	120:20,21	99:9 100:14	101:10 102:19
101:19 104:9	99:13 119:14	125:6	101:7 107:13	108:12 109:1
106:5,8,19	opinions 13:3	page 5:2,8,12	108:16 113:2	118:19 121:12
107:4,8 120:1	14:9 24:19	6:4,11 43:16	117:20 119:3	125:1
121:5,6,18,19	40:19 44:1	68:7,8 104:22	122:16	patent's 83:10
121:19 122:7,8	92:17	114:17 116:1	parties 75:4	patentable 36:12
122:21 123:8	opposing 103:1	119:14,20,21	76:19 79:2	37:2,21 38:14
124:1,2,2,3,9	103:19	127:14 128:7	126:12,15	41:8
objections 39:3	opposite 43:10	129:11	partner 7:10	patents 29:6
57:11 74:13	45:12	pages 104:19	party 73:2	75:5 79:4
76:4 80:9 83:2	optimize 74:20	126:5 128:12	pass 101:12	path 112:10
obligated 8:9,12	option 127:11,12	paid 24:5 26:7	102:9	113:7,10 114:6
8:14 77:9	order 71:11,17	34:18 35:3	passes 107:11	pattern 109:22
obligation 24:18	77:20 94:1	panel 94:16	108:7	110:2
obligations	97:15	paper 43:3,7,12	patent 1:1,2,8,11	pause 19:5,12
76:15,17,21	ordinary 59:12	43:17,20 44:3	7:9 10:15	paying 26:17,19
77:2	59:14,21 73:20	44:4,7,11,19	18:22 20:1	26:21 27:1,2
observation	original 127:13	45:10 103:8,18	22:4,5,7,13,21	35:6,10,11,14
110:20 119:5	outcome 33:6,15	103:20,21	23:4,8,10,13	35:18 36:2
obtained 90:3	33:17 35:2,4	104:1,4,12	23:16 26:21	peak 107:17,18
91:7 93:12	126:17	105:3,18,22	27:1 33:9,12	107:21
116:2	outside 39:14,15	107:13 109:14	33:19 34:6	peer 64:19
obviously 44:19	45:7 55:14	110:13,14,15	35:17,21 36:1	peer-review
50:14 91:20	56:4,9 64:20	112:1,7,16	36:21 37:2,17	66:8
occurred 47:17	72:18 92:13	113:3 115:13	37:19 38:12	pending 49:4
October 5:13	103:16	116:16 118:22	39:20 40:11,12	Pennsylvania
105:17,19	owe 76:18	119:4,6	40:12,17,20	2:8 4:6 127:3
offer 61:8 92:17	owed 76:16	papers 15:7 55:6	41:5 46:4 48:6	people 16:1 29:9
offered 61:8	owner 1:8 7:9	121:10 123:16	49:21 50:20	29:10,11,15
office 1:1 127:9	10:15 20:1	124:21	57:20 59:6,10	30:13 32:12
127:17	22:4,7,13	paragraph	59:16,19 60:4	62:12,15 64:22
offices 2:7	23:10,13,16	61:12,14 63:17	60:9,17,19	65:18,21 66:10
okay 17:18	26:21 27:1	68:8	72:16 73:10,15	67:18 68:1,2,3
21:11 24:15	35:17,21 36:1	parameters	73:16 75:11,13	68:5
58:11,19 61:11	40:11 46:4	99:11	78:5,18 79:7	percentage
76:8 120:8	48:6 49:21	part 14:14 23:22	80:6,7,21	34:10
121:6	50:20 60:19	37:7 53:14	81:13,21 82:1	performing
once 8:21 13:5	102:19	67:6,9 118:8	82:3 83:14,17	107:10
ones 16:6 63:16	Owner's 23:4	participants	83:22 87:19,22	period 127:15
75:19 80:8	ownership 20:16	19:13	88:2,11,21	permitted 78:20
ongoing 81:21	20:19 21:7	participated	89:7,15 90:2,8	person 21:22
82:3,19	22:13		90:15 91:1	59:7,12,20

60:1 73:22 90:16,21 118:4 personal 27:19 37:6 39:13,19 40:11,12 73:5 73:8,13 personally 17:7 24:12 32:20 33:7 34:4 37:1 52:13 62:7 70:4 persons 23:6 Petitioner 1:5 2:5 3:2 5:8 7:5 7:17 18:1 121:1 Petitioner's 106:1,15 physics 29:13 30:19 45:3 52:22 53:22 place 11:2 126:7 plain 59:14 73:20 planning 13:10 please 7:21 9:1 17:15 18:7 19:10 38:5 39:3,10 59:3 60:21 61:11 72:3 127:8,12 127:13,16 PLLC 2:8 4:3 127:2 point 51:15,22 64:21 65:13 72:2 87:1 118:2 pointed 30:22 pointing 80:1 points 64:17 polycrystalline 84:17 portion 24:3 51:19 105:2 portions 42:22 position 37:12	41:2 43:11 65:4 67:9 108:5,14 109:16 119:8 positions 45:12 possible 50:5 62:8 105:8 post-peak 111:9 112:12,21 115:5 116:10 117:6 118:9,9 potential 97:14 potentially 96:12 practice 80:21 practiced 72:15 81:13 practicing 78:5 78:18 82:1 predominantly 84:19 87:14 premises 68:19 preparation 11:8 prepare 9:6 103:2 104:6 prepared 24:22 43:18 preparing 10:7 12:16,19 13:6 42:12 44:4 52:18 53:9,15 53:18 54:6 57:18 72:2 101:18 present 3:20 21:9 71:20 73:2 presentation 68:4 69:1 presentations 68:19 presented 41:16 41:20 presenting 50:9 presume 65:1 pretty 10:6	previous 23:1 85:19 97:2 116:15 122:8 123:1,10 previously 6:3 72:6 principles 37:15 40:14 45:1,3 prior 12:19 15:10 22:16 31:8 32:2 37:4 43:22 44:14,19 45:18 46:7 47:12,20 49:21 60:11 67:7 81:15 86:8 92:22 98:9 99:17 104:21 119:3 124:10 privilege 49:18 58:6,21 77:7 81:1 100:5 privileged 9:10 13:16 26:2 27:13,15 34:14 36:6 42:10,15 47:7 48:15 49:9 72:22 73:3 81:3,10 82:7,12 89:21 91:8 93:15,16 94:9,21 95:2 95:15,17 96:8 96:11,13 97:9 97:11 101:2 probably 60:22 65:3 68:1 problems 65:10 procedure 114:11,14,15 127:16 proceed 57:15 71:17 proceeding 33:21 proceedings 19:12	proceeds 34:5 34:11 process 42:11,17 66:8 product 13:16 69:22 74:18 99:10 professional 64:4,5 professor 1:17 2:3 5:3 7:12 17:15 58:21 61:15 62:21 63:7 64:15,15 95:1 96:10 102:21 119:12 120:8 127:1,6 128:9 129:9 Professors 62:17 profile 67:8 88:4 88:13 107:16 111:12 115:17 116:4,10,19 118:10 profiles 110:18 114:4,20 pronounce 83:9 propagate 121:4 121:17 122:6 122:19 123:6 123:21 propagated 54:20 proper 79:15 proposed 12:5 117:17 prosecution 59:10,16,19 73:21 90:15,20 protective 77:20 provide 18:6 93:11 94:10 115:11 provided 14:13 57:5 65:3 107:22 109:16 109:19	provides 58:7 providing 13:11 56:3,20 66:21 PTAB 34:19 36:11 37:1,20 38:13 39:4 41:7,11,17 Public 2:11 7:15 126:1,2,19 publication 104:11,21 108:2 109:11 119:19 publications 14:20 16:14 30:21 54:22 111:15,20 publicly 70:14 publish 105:21 published 44:11 44:19 105:9 111:16 112:8 publishing 68:14 109:14 purchased 127:10 pure 117:2 pursuant 2:5 put 16:3 17:2 85:10 110:15 puts 113:10 putting 76:21 110:17
Q				
qualify 87:21 quality 100:15 quantified 16:2 quantify 16:7 quartz 84:2,7,9 84:13 85:5,8,9 85:13,17 86:12 question 19:6 25:11 28:6,9 31:2,9 32:11 38:3,5,9,18,19 39:6,11,22				

40:2,8 49:3,4,5 49:6 56:18 57:3,10 59:1,3 60:2 71:18 73:6 77:6 78:11,14,19 79:1,5,9,17,19 80:3,4,5,12 81:19,22 82:13 82:17 83:1 84:4 85:20 86:9 88:9 89:12 90:4 91:5,12,21 92:3,11 94:14 95:1,17 96:10 97:2,11 99:17 100:8 121:15 122:13 123:12 questioning 21:3 21:10 25:7 55:18 56:16 57:1 70:10 71:21 72:18 103:5 questions 55:20 56:1,11,14,15 56:21 57:12,13 57:13 77:1 79:16,21 80:14 80:16 106:8 120:16 125:3,4 127:16 128:15 128:17 quick 120:17 quickly 101:21 R R 7:1 Rachuba 4:4,9 5:5 7:8,8 9:8 10:13 11:13,20 12:21 13:13 14:4,11,18 15:4,19 17:13 18:7,14 21:2 21:15 22:8,15	22:22 25:5,21 27:10,18 28:12 28:18 29:7,21 31:7,14 32:1,9 33:1,22 34:12 36:4,13 37:3 37:22 38:6,15 38:22 39:5,12 40:1,5 41:9 42:13 44:16 46:15 47:1,13 47:19 48:13,20 49:3,8,12 50:1 50:22 51:8 52:6 55:17,22 56:7,12,20 57:5,9 58:3,10 58:17,20 60:10 69:8,18 70:8 70:16 71:14 72:17 73:18 74:6,13 75:6 75:14 76:4,10 77:16 78:7 80:9,22 81:14 82:5 83:2 84:3 84:8,14,22 85:6,18 86:5 86:14 87:5,11 88:15,22 89:4 89:16 90:12 91:2,16 92:20 93:8 94:6,18 95:11 96:5 97:6,19 99:16 100:1,22 101:19 102:12 102:20 103:17 104:10 106:11 106:13,14,21 107:6 119:10 120:7,16 121:5 121:18 122:7 122:21 123:8 124:1,9 125:4 Raja 4:5 7:10 ramp 107:17	108:9 111:9 112:19 114:21 115:2,20 116:5 116:8,13 117:5 117:6 118:7,8 rate 26:10,12,14 Rayleigh 107:19 re-read 80:15 reach 65:17,18 65:19 66:7 reached 68:16 reaching 65:20 read 7:3 15:7 43:4 44:12 106:1 116:1 128:11 reading 44:22 ready 127:8 really 16:7 53:5 53:13 64:8 66:4 82:17 94:14 102:3 113:15 realtime 78:21 reason 8:17 12:18 45:6 50:18 51:18 54:10 111:14 124:8,12,17 recall 10:11 25:17 26:5 45:17,18 46:3 46:6 47:14,21 48:9,11 50:3,8 50:18 51:2 52:1 60:5,12 67:22 70:7 71:4,7 83:16 83:19 98:9,17 103:4,7 receive 23:15 34:5,11 received 27:4 105:11,14,16 receives 108:1 recognize 18:8 recollection	45:21 reconfirming 54:17 record 7:22 19:8 19:10,11,15 58:12,18 70:18 70:20,21 76:6 76:9 80:17,19 96:16 97:21 102:16 120:19 126:10 recorded 128:15 128:18 rectangle 102:1 red 114:3 115:15 reduced 126:9 reference 110:8 117:15 119:21 120:2,5 referenced 127:8 references 14:20 16:20 99:4 110:8 114:12 119:18 referred 6:3 9:14 10:2 42:20 referring 17:5 82:4,21 reflect 49:13 reflected 40:22 reflection 118:16 reflections 64:5 regarding 78:9 82:19 regardless 35:4 Regents 1:7 127:4 128:8 129:8 regular 111:11 reiterate 76:10 related 10:17 50:16 93:17 126:12 relating 93:16	relationship 22:3,6,11 50:19 relative 126:14 relevance 39:1 44:17 47:1 75:7,15 76:5 78:8 81:1 82:15,15 84:15 85:1,7,19 86:8 87:12 89:1,5 89:17 91:3,17 93:9 94:7,19 95:12 96:6 97:7 99:17 100:2 101:1 121:19 122:22 123:9 124:2,10 relevant 37:14 45:2,9,11 58:6 relied 52:21 53:2 53:6,12,13,17 104:5 106:15 rely 52:18 53:8 53:10 54:4 56:5 57:3,17 remained 112:14 remember 48:18 48:21 67:5 79:21 remove 63:13 repeat 25:11 40:9 59:3 repeating 85:22 repeats 108:3 report 9:21 10:2 11:16,19 13:5 14:7,14 34:22 40:22 41:13 54:7,10 57:4 67:10 102:4 119:2,7 reported 116:15 represent 79:18 representative 3:21 7:7
--	--	---	---	---

represented 19:18	89:20 91:8	104:2	search 12:19	5:4 7:3,4,18
representing 7:9	93:15 94:9,20	Saliba 4:5,10	second 70:18	10:8 11:17
20:1 51:10	95:15 96:7	7:10 10:14	76:7 114:17	12:12 13:9,17
reproduction	97:8	58:12 70:17	116:3	14:8,15 15:1
15:9	revealing 26:1	77:19 102:11	section 105:1	15:16 16:9
request 6:10	34:14 36:6	102:15	see 37:5 46:16	17:19 18:3,11
80:14	42:10,15 72:22	sample 123:13	55:4 58:4,5	18:19 19:4,7
require 77:1	81:3 95:2,17	samples 123:20	61:17 63:21	19:14 21:12,18
118:5	96:11 97:11	satisfied 98:11	64:13 68:11	22:12,19 23:5
required 39:4	100:5 101:2	satisfies 92:17	102:3 104:14	25:8,10 26:3,6
118:18 124:22	revenue 24:8	saw 97:19	104:22 105:2,6	27:14 28:5,14
requires 121:12	review 30:12	saying 124:6,13	112:5 115:17	29:1,19 31:5
research 30:1	42:18 43:22	says 105:10	117:2,5	31:10,17 32:6
68:9,15 69:5	64:19 99:3	108:19,21	seeking 91:6	32:15,18 33:4
69:15 74:4,12	127:10	109:20 114:18	seen 62:12,13	34:3,17 36:10
74:15,19,20	reviewed 9:12	science 5:14	selected 127:12	36:15 37:18
75:5 79:3,12	9:13,19 10:3	36:20 37:9,16	semiconductor	38:4,10,20
79:12,13	11:7,22 12:17	41:3,13 52:21	65:7 74:11	39:2,9,17 40:3
researcher	30:3,9 42:19	53:1,14,21	send 105:12	40:7 41:6,21
65:16	42:21,22 53:11	87:1 104:16	sense 28:20 69:3	43:14 45:14
researchers 65:5	53:15,17 54:1	112:14	sensor 96:3 97:4	46:18 47:8,15
respond 36:16	101:20	scientific 13:2	sent 63:9	48:1,17,21
Respondent 4:2	reviewer's	30:4,20 36:20	sentence 61:13	49:6,11,19
5:12	105:15	37:14 40:14	63:18 64:2	50:4 51:5 52:2
Respondent's	reviewers	41:14 45:1,3	66:9,22 68:9	52:9 55:11,19
6:5	111:17	53:5 54:18	88:7	56:2,9,17 57:2
response 18:6	reviewing 9:20	scientist 33:11	sequence 80:13	57:7,14,16
56:21,22 103:8	53:14	37:7 107:9	80:15	58:8,11,19
responsible	revised 105:14	124:14	serious 30:4,20	59:4 60:14
35:10,11,14,17	right 9:22 20:11	scope 39:14,15	41:14 54:18	61:4 69:9,21
36:2	44:3 57:9 63:9	45:7 47:2,13	serve 25:16 26:7	70:12,19 71:1
responsive 56:11	65:18 67:11	55:14 56:4,10	49:21	72:13 73:12
restate 88:9	70:3 122:20	72:19 73:18	set 16:1 19:12	74:2,9 75:3,12
restrictive 71:10	124:7	74:7 75:7,15	114:1 115:14	75:18,21 76:2
result 88:3,12	rise 114:16,22	76:5 81:1	sharp 116:14	76:8 77:4 78:1
results 109:10	115:4,21	82:14,15 84:15	sharper 111:10	78:2,15 80:18
109:13 113:18	roles 51:3	85:1,7,19 86:7	118:10	81:7,17 82:20
115:12	Roman 4:4 7:8	87:12 89:5,16	shear 15:12	83:3,7 84:5,11
Resume 58:16	row 39:6,8	91:3,17 92:2	sheet 127:13	84:20 85:4,14
61:3 70:22	rsaliba@sugh...	92:14,21 93:9	128:16 129:6	85:21 86:10,17
83:6 96:22	4:12	94:7,19 95:12	Sherman 8:4	87:7,17 88:19
98:1 102:18	rules 39:4	96:6 97:7	shock 29:13	89:2,6,13 90:5
120:21	127:16	99:16 100:2	30:18 45:3	90:18 91:13
returned 55:9	S	101:1 103:16	52:22 53:22	92:15 93:4
reveal 9:9 13:15	S 7:1	106:6,11 121:6	89:11 107:19	94:3,15 95:7
49:9,16 82:8	S-P-A-L-L-A-...	121:19 122:22	112:5	96:1,17 97:1
		123:9 124:2,10	Shomaker 3:4	97:17,21 98:2

99:18 100:17 101:15 102:5,9 102:14 103:15 104:9 106:5,12 106:19 107:4,8 120:1,17 121:2 121:14 122:1 122:17 123:4 123:19 124:5 125:2 shorthand 126:7 show 70:16 111:14,19,19 showed 102:4 110:7,15 showing 16:22 shown 113:19 119:13 shows 12:9 109:14 111:7 112:8 113:5,20 114:8 123:17 SiO2 87:14,15 side 113:14 sidebar 58:9 sign 127:9,10 signals 30:6 signature 127:8 127:14 128:7 128:19 129:22 signed 71:6 127:13 significant 118:16 signing 127:12 silica 54:14 84:10,21 85:2 85:15,16 86:2 86:12 87:20,21 107:12,15 108:7,22 110:7 110:16,19 111:8 112:9,9 112:17 113:7 113:10,17,19 114:6 115:8,9 115:13,19	116:11 117:3,4 121:3,7,8,10 121:16 122:5 122:14,16,19 123:6,14,21 124:15,20 silicate 87:16 similar 101:9 Similarly 30:18 simply 54:11 Sincerely 127:19 SiO2 84:19 85:3 86:4 sitting 31:19,22 32:22 skill 59:8,12,21 60:1 74:1 90:16,21 skilled 118:5 slightly 114:20 SMITH 3:3,11 sodium 87:15 solid 63:20 67:17 somebody 29:16 30:10 32:4 64:19 somewhat 66:19 soon 25:18 sorry 32:19 48:20 50:13 88:6 119:11 Sottos 17:5,8,10 29:20 31:3 120:4 Sottos' 31:12 32:21 spallation 5:16 15:18,22 16:2 16:7 17:1 18:17 28:11,17 33:14 43:5 69:11,19 72:8 75:9 104:1 speaking 71:6 specific 78:19 79:1,14	specifically 99:9 specification 59:9,15 73:22 90:14,20 spelled 93:6 spend 23:20 24:3 62:1 spent 43:7,12 spoke 62:12 spoken 62:15 square 102:2 stake 20:16,19 20:20 stand 34:4 62:10 102:6 standing 55:12 106:8 start 45:15 46:13 57:18 started 46:3 48:9 starting 15:10 starts 63:18 state 7:21 61:14 stated 11:7 78:10 statement 12:5 61:22 62:5,8 63:12 64:9 66:5,7 67:4,6 108:20 109:7 124:13 States 1:1 61:16 stay 19:7 stem 30:2 stepping 75:22 steps 120:13 strain-rate 5:16 43:4 104:1 strategy 49:16 Street 1:21 3:13 8:3 128:3 129:2 strength 15:13 stress 5:18 12:3 43:6 54:13 55:4 88:3,12	104:3 107:11 107:15,16,20 108:6,8 109:2 110:6,18 111:7 111:10,11 112:1,10,10,13 112:18 113:7 113:11 114:5,7 114:16,19 115:6,18 116:3 116:22 117:13 117:19 118:20 121:4,11,17 122:6,12,14,19 123:7,17,22 124:22 stressed 115:1 stresses 113:21 stretched 116:4 116:7 structure 21:7 24:13 85:12 89:9 93:20 99:6,7,13,19 100:12 112:12 124:15,17 structures 100:12 stumbled 9:20 12:15 13:7 43:3 44:4 subject 71:16 submitted 41:1 43:8 44:6 120:12 submitting 44:15 substance 9:3 55:20 61:7 82:8 substrate 107:12 113:12,14 115:7 117:1,22 118:12 subtleties 124:16 suggest 64:17	65:13 suggesting 123:3 Sughrue 2:8 4:3 127:2 Suite 1:21 2:9 3:6,14 4:7 127:3 128:3 129:2 summary 12:1 superposition 110:3 supervision 72:9 126:9 supplemental 13:11 support 37:10 supported 41:2 supportive 32:13 supports 36:21 37:16 40:16 41:1 sure 18:8 43:16 47:4 50:10,17 76:1 78:1 80:16 86:5 101:5 102:14 surface 118:14 118:17 surprise 16:10 16:13,15 surprised 45:9 surprising 107:3 switched 51:4 switchover 50:17 51:6,19 51:22 sworn 7:14 126:6 symbol 102:1
T				
take 8:21 11:2 15:3 18:7 83:3 85:9,11 96:15 102:11,12 120:13,17				

taken 18:21 45:13 58:13 61:2 83:5 96:19 97:22 102:17 108:5 108:15 120:20 126:4,7,13 talk 58:1 68:5 talking 28:20 72:7 talks 66:2,3 tangible 69:22 tape 95:8 96:3 97:4 taught 109:1 technically 24:10 technique 15:22 16:3,8 17:1,3 30:17 69:12 75:9 technologies 18:18 33:14 technology 15:18 28:11,17 28:22 29:4,5 29:10,11,14 30:14 31:2 40:15,16 41:2 41:4 53:3 69:20 71:5,9 71:13 73:11 tell 8:10 42:11 66:16 77:8,9 78:12 80:2 122:5 temperature 85:11 tensile 116:22 117:12 tension 55:3 111:3,5 112:20 113:1 116:20 117:21 118:15 118:16 tenure 61:15 62:21 63:7	64:16,19 term 87:4,8 88:1 88:10 terms 28:21 59:9 59:22 60:4,9 60:17 86:12 testified 7:15 78:4 98:14 testify 24:19 testifying 24:16 testimony 9:3 22:16 23:1 32:2 37:4 39:15 47:20 55:12 56:3 60:11 61:7 71:15 81:15 92:22 98:6 122:9 123:1,5 123:10 124:11 126:5,6,10 testing 115:12 Texas 3:7 65:6 Thank 98:4 102:22 thereto 126:16 thesis 15:11 16:21 17:4 30:1,2 45:2 54:20 108:1,4 108:13,20 109:4,6 110:9 110:11,21 111:1 112:3,3 112:16 117:10 117:11 118:2 121:9 123:15 124:21 thickness 88:5 88:14 thing 52:16 things 63:3 think 10:4,6 11:21 12:1 14:16 15:2 18:15 22:10 27:14 28:15	29:18 38:2,8 41:11 48:8 50:7 52:20 58:22 64:16 65:12 66:4 68:6 69:3 70:12,15 72:5 72:11 74:3 80:13 86:1 97:13 100:9 third 73:2 76:19 third-party 71:16 thoughts 11:11 14:2 thousands 68:2 three 115:14 time 1:19 18:8 23:19 24:2,6 40:20 43:7,12 48:5 50:6,20 54:6,20 55:16 60:22 62:1 71:5 83:20 97:18 114:17 114:22 115:4 115:21 126:7 127:15 timeline 48:9 times 39:6,7 66:13 title 103:22 today 7:5 8:6,10 8:19 9:4 25:1 32:22 42:2 102:7 told 35:22 62:2 66:11 67:12,18 67:21 81:12 92:4 tool 69:6,10,14 69:17 72:8,15 top 104:15 totally 119:4 TRADEMARK 1:1 transcript 5:10	10:4 19:2 21:16 43:1 71:21 76:13 127:8,9 128:12 transcription 128:15,17 transfer 71:4,9 71:12 transferred 72:15 73:11 transmits 113:12 transmitted 88:4,13 TRIAL 1:2 trick 79:16 tried 109:7,8 true 57:15 61:22 62:5 63:13,15 108:3 113:16 126:10 128:14 128:16 truth 8:10 77:9 77:10 truthful 8:18 trying 51:21 64:19 65:18 tungsten 5:17 43:5 104:2 turn 60:21 61:11 turning 118:7 two 110:3 113:4 114:12 type 66:20 98:21 100:11,11,18 typewriting 126:9 typos 101:21 U U.S 1:11 UCLA 62:3 64:14 65:4 66:8 74:17 ultimately 109:8 uncovered 43:13 54:8	undermines 55:7 understand 8:5 8:9 9:2 24:15 29:12 51:21 56:12 59:8,13 59:21 77:11,12 77:13,18 91:14 122:11 understanding 18:12 57:19 59:5,18,20 63:4 72:14 77:22 81:20 82:2,6,9,11 84:6 86:11 87:3,18 90:7 90:10 understood 73:22 90:16,21 106:13 unfortunately 52:1 United 1:1 61:16 universities 63:10 69:1 university 1:7 10:18 127:4 128:8 129:8 unknown 111:14 unloading 115:2 116:8,12 unpatentable 34:20 unusual 65:4 Urbana-Cham... 17:3 use 29:11 30:13 42:7 74:11,18 75:4 79:3 87:10 112:9 115:8 uses 108:11 V v 1:6 127:4 128:8 129:8
---	--	--	--	---

valid 36:22 37:17 validated 40:17 41:5 value 107:21 112:12 117:6 118:9 various 30:6 Vassilli 33:10 83:11,18,21 venture 45:7 verbatim 67:13 80:5 verify 61:21 63:6 version 42:5,7 versus 83:17 view 29:22 59:9 59:15 87:1 90:1 Vijay 1:17 2:3 5:3,10 7:12 8:1 127:1,6 128:9 129:9 violate 77:2 volume 104:17 Vossen 16:4	30:1 31:12 32:21 43:10 44:8 48:12 49:7,22 50:21 106:2,16 110:21 119:8 119:16 want 19:7 36:11 36:18,18,21 37:1,6,8,11,17 37:20 38:13 40:17 41:7 43:15 58:4,8 80:16 101:4 Washington 1:21 2:9 3:15 4:8 127:3 128:4 129:3 wasn't 63:13 wave 12:4 29:13 30:6 45:4 52:21 54:13 55:3 88:3,12 100:13,21 107:11,15,16 108:6,8 109:2 110:6,18 111:3 111:5,7,12 112:1,10,11,13 112:18 113:8 113:11 114:5,7 114:16,19,22 115:3,7,18 116:6,20 117:2 117:19,21 118:6,7,11,13 118:15,20 121:4,11,17 122:6,12,14,20 123:7,18,22 124:22 waveform 99:1 waves 5:18 43:6 101:11 104:3 110:3 way 11:21 15:20 22:17 28:13,15	67:14 79:15 88:17 101:6 ways 113:4 we'll 7:3 8:21 57:15 we're 21:6,15 23:3 28:20 43:16 67:5 Weaver 120:3 website 9:22 12:9 44:12,13 week 9:17,17 24:1 welcome 42:7 61:5 83:8 98:3 102:21 whatsoever 117:8 when's 50:17 white 55:5 widely 63:19 64:1,3 68:10 68:13 69:4 witness 2:4 5:2 7:2,13 9:9,12 11:14,21 12:22 13:14 14:5,12 14:19 15:6,20 17:18 18:10,15 20:4,10 22:10 22:17 23:2 25:22 26:5 27:11,12 28:4 28:13,19 29:8 29:22 31:16 32:3,10,16 33:3 34:2,16 35:1 36:8,14 37:5 38:2,8,17 40:9 41:11 42:17 44:18 46:16 47:3,14 47:21 48:14 50:3 51:2,9 52:8 56:2,17 58:15 59:2 60:12 69:19	72:5,21 73:7 73:19 74:8,14 75:8,16 77:12 77:18 78:11 80:11 81:5,16 82:6,16 84:4,9 84:16 85:2,8 86:15 87:6,13 88:16 89:8,19 90:13 91:4,18 93:1,10,14,19 94:8,13,20 95:4,14,19 96:7,21 97:8 97:13 100:3,9 101:4,20 102:10 106:20 107:5,9 120:2 121:7,21 122:10 123:2 123:11 124:4 124:12 126:4,6 126:11 127:10 128:9,19 129:9 word 32:11 69:4 88:7 work 12:5 13:16 14:17,21 15:3 15:10,11,14 16:12,17,20,21 17:11 25:20 27:5 30:8,9 31:13,22 32:5 32:8,13,13,21 34:18 45:15 49:2 65:14 70:7 75:1 81:21 82:3,18 82:21 83:13 94:14 97:15 98:15,20,21 108:14,20 109:5 110:10 110:11,18 116:15 117:17 119:15 worked 46:21	74:17 working 46:4,13 48:6,10 53:4 64:6 works 24:13 world 65:11 66:17,17 68:17 68:20,22 69:2 write 68:9 writes 64:22 116:12 writing 42:4 44:20 67:4,6 114:9 written 92:6 102:7 127:22 wrote 16:22 66:6 66:8,22 112:16 X Y yeah 26:5 33:3 36:8,17 42:17 47:21 50:3 51:2 57:2 60:12 70:19 81:5 83:19 97:19,21 year 104:18 years 14:17 53:4 54:21 55:9 62:7,11 64:20 75:2 109:12 yes-or-no 60:2 yesterday 9:18 11:5 younger 62:21 youngest 61:15 63:7,16 Z zero 107:21 zoom 11:4 19:13 19:17 21:13 76:3
--	--	---	--	---

0	129:2	28 119:19 120:2	100:15 101:10
	18 5:10 116:5,8	126:22	108:12 109:1
1	1978 16:4	3	118:4,19
1 113:5,9 115:11	1992 110:7,12,12	3 113:19 114:2	121:12 125:1
116:14 118:19	110:14 112:1	114:19	7
119:13	112:15 117:15	3.19 110:22	7 5:4
1:15 102:18	119:6	111:6,13 112:3	7,487,684 1:11
1:37 120:20	1999 71:5	112:6 117:10	71 6:13
1:48 120:21	19th 105:13	300 3:5	73-80 104:19
1:52 125:6	2	31 61:14 63:8	74 119:14,20
10 61:12,14	2 116:1	370-8324 3:16	75 114:17
64:20 102:13	2000 2:8 4:6	4	75201 3:7
115:2,6 116:9	71:5 112:15	4 68:7	76 116:1
116:13 117:7	127:3	40 53:4 62:7,11	8
10:00 1:19	20006 2:10 3:15	402 72:16 73:10	8 55:9
10:50 58:13	2002 120:4	73:15,16 75:11	812 1:21 128:3
10:52 58:16	20036 1:21	83:22	129:2
10:55 61:2	128:4 129:3	42 6:6	9
100% 20:20	20037-1811 4:8	5	9:59 2:7
1000 3:14	127:3	5 68:8 114:21	9000 2:9 4:7
102 5:5	2008 5:13 105:5	115:1,5,13,21	127:3
103 5:18	105:9,13,17,19	116:7	91403 8:4
1040 5:9 17:21	2009 55:1	500 26:11	978-4218 3:8
18:1,5,13	104:13,18	504 104:17	
11 1:18 2:6	105:22 112:8	6	
127:5 128:10	2011 6:5 42:8	663-7468 4:10	
129:10	2013 5:13	663-7945 4:9	
11:10 61:3	103:12,13,16	684 18:22 22:21	
11:22 70:20	103:19 107:1	23:7 34:6	
11:23 70:22	202 1:22 3:16	37:19 38:12	
11:35 83:5	4:9,10 128:5	57:20 59:6	
11:45 83:6	202)-232-0646	60:4,9,17	
11:58 96:19	127:17	75:13,16 78:5	
12 5:9 63:17	202)232-0646	78:18 79:7	
68:8	129:4	80:6,7,21	
12:01 96:22	2024 5:9	83:10,14 87:19	
12:02 97:22	2025 1:18 2:6	87:22 88:21	
12:51 98:1	127:5,21	89:7,15 90:2,8	
12:56 102:17	128:10 129:10	91:1 92:18	
1200 3:6	2030 126:22	93:3,7 94:5,17	
121 5:4	21 5:13 6:12	95:10 96:4	
13 118:19	214 3:8	97:5 98:12	
14 105:17	21st 105:19	99:22 100:10	
15 6:12	22 6:13		
15135 8:3	232-0646 1:22		
1717 3:13	128:5		
1730 1:21 128:3			