

Scientific usage of the PENCIL CODE

Search results using <http://adslabs.org> and
Bumblebee <https://ui.adsabs.harvard.edu/>

<http://pencil-code.nordita.org/highlights/>

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A search using <http://adslabs.org> or Bumblebee <https://ui.adsabs.harvard.edu/> lists the papers in which the PENCIL CODE is being quoted. In the following we present the papers that are making use of the code either for their own scientific work of those authors, or for code comparison purposes. We include conference proceedings, which make up 15–20% of all papers. We classify the references by year and by topic, although the topics are often overlapping. The primary application of the PENCIL CODE lies in astrophysics, in which case we classify mostly by the field of research.

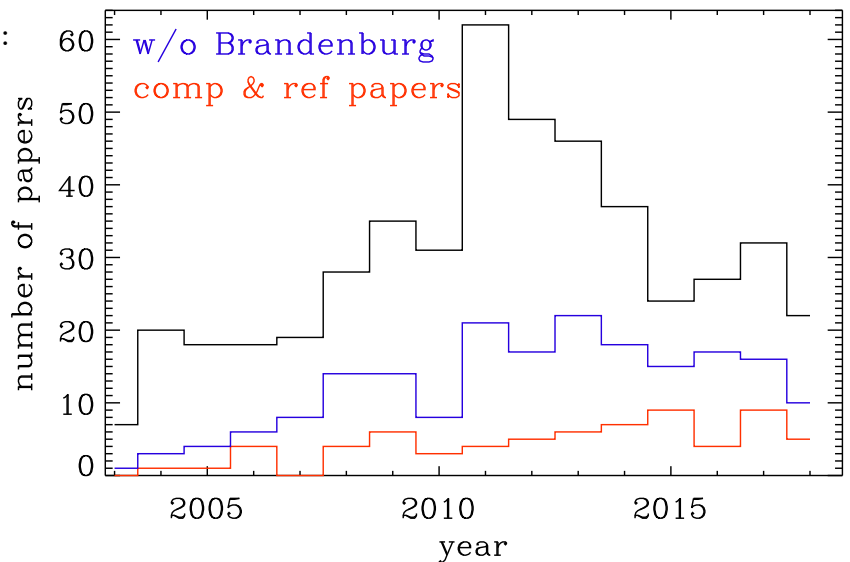


Figure 1: Number of papers since 2003 that make use of the PENCIL CODE. In red is shown the number of papers that reference it for code comparison or other purposes and in blue the papers that are not co-authored by Brandenburg. The enhanced number of papers during 2011–2013 results from publications related to his ERC Advanced Grant.

1 Papers by year

As of June 2018, the PENCIL CODE has been used for a total of 475 research papers; see Figure 1; 194 of those are papers (41%) are not co-authored by Brandenburg. In addition, 68 papers reference it for code comparison or other purposes (see the red line).

1 times in 2019 (Brandenburg, 2019b,a),

22 times in 2018 (Gent et al., 2018; Schreiber and Klahr, 2018; Bushby et al., 2018; Schober et al., 2018b; Trivedi et al., 2018; Aarnes et al., 2018; Zhang and Yan, 2018; Bourdin and Brandenburg, 2018; Brandenburg et al., 2018a,b; Bourdin et al., 2018; Korsós et al., 2018; Rice and Nayakshin, 2018; Schober et al., 2018a; Losada et al., 2018; Richert et al., 2018; Mitra et al., 2018; Bhatnagar et al., 2018; Brandenburg and Chatterjee, 2018; Käpylä et al., 2018; Kuchner et al., 2018; Perri and Brandenburg, 2018; Brandenburg, 2018),

32 times in 2017 (Bhat et al., 2017; Kahniashvili et al., 2017; Aarnes et al., 2017; Hollins et al., 2017; Li et al., 2017b; Reppin and Banerjee, 2017; Singh et al., 2017; Hord et al., 2017; Lyra et al., 2017; Viviani et al., 2017; Baehr et al., 2017; Park, 2017; Sharma et al., 2017; Brandenburg and Kahniashvili, 2017; Käpylä et al., 2017a,b; Haugen et al., 2017; Gent et al., 2017; Osano and Adams, 2017; Cameron et al., 2017; Pekkilä et al., 2017; Brandenburg et al., 2017a,b,c,d,e,f; Aiyer et al., 2017; Li et al., 2017a; Jabbari et al., 2017; Rempel et al., 2017; Smiet et al., 2017),

27 times in 2016 (Chatterjee et al., 2016; Chamandy, 2016; Chamandy et al., 2016; Candelaresi et al., 2016; Bhat et al., 2016a; Adams and Osano, 2016; Osano and Adams, 2016a,b,c; Krüger et al., 2016; Bhat et al., 2016b; Yang and Johansen, 2016; Cole et al., 2016; Kahniashvili et al., 2016; Warnecke et al., 2016a,b; Jabbari et al., 2016; Lambrechts et al., 2016; Bourdin et al., 2016; Threlfall et al., 2016; Bhat and Brandenburg, 2016; Tian and Chen, 2016; Rodrigues et al., 2016; Lyra et al., 2016; Karak and Brandenburg, 2016; Yokoi and Brandenburg, 2016),

24 times in 2015 (Singh and Jingade, 2015; Jabbari et al., 2015; Jabbari, 2015; Chen et al., 2015; Johansen et al., 2015; Richert et al., 2015; Park and Park, 2015; Park, 2015; Smiet et al., 2015; Carrera et al., 2015; Gibbons et al., 2015; Baehr and Klahr, 2015; Snellman et al., 2015; Babkovskaia et al., 2015; Raettig et al., 2015; Andrievsky et al., 2015; Carrera et al., 2015; Chaudhuri, 2015; Singh et al., 2015; Lyra et al., 2015; Karak et al., 2015a,b; Brandenburg and Hubbard, 2015; Brandenburg et al., 2015),

37 times in 2014 (Carrera et al., 2014; Yang and Johansen, 2014a; Bourdin, 2014; Adams and Osano, 2014; Gent, 2014; Yang and Johansen, 2014b; Subramanian and Brandenburg, 2014; Singh et al., 2014; Jabbari and Brandenburg, 2014; Jabbari et al., 2014; Karak et al., 2014; Warnecke et al., 2014; McNally et al., 2014; Brandenburg et al., 2014; Gibbons et al., 2014; Pan and Padoan, 2014; Pan et al., 2014a,b; Lyra, 2014; Bhat et al., 2014; Losada et al., 2014; Rheinhardt et al., 2014; Mitra et al., 2014; Turner et al., 2014; Dittrich et al., 2014; Brandenburg and Stepanov, 2014; Chian et al., 2014; Brandenburg, 2014; Park, 2014b,a; Käpylä et al., 2014; Modestov et al., 2014; Cole et al., 2014; Rüdiger and Brandenburg, 2014; Warnecke and Brandenburg, 2014; Barekat and Brandenburg, 2014; Väisälä et al., 2014),

46 times in 2013 (Lyra and Kuchner, 2013; Bourdin et al., 2013a,b,c; Félix et al., 2013; Hubbard, 2013; Park et al., 2013; Park, 2013a,b; Getling, 2013; Devlen et al., 2013; Gent et al., 2013a,b; Brandenburg and Lazarian, 2013; Pan and Padoan, 2013; Mitra et al., 2013; van Wettum et al., 2013; Candelaresi and Brandenburg, 2013a,b; Kahniashvili et al., 2013; Lyra,

2013; Bhat and Subramanian, 2013; Raettig et al., 2013; Del Sordo et al., 2013; Chamandy et al., 2013; Di Bernardo and Torkelsson, 2013; Jabbari et al., 2013; Dittrich et al., 2013; Bingert and Peter, 2013; Brandenburg and Rädler, 2013; Bykov et al., 2013; Brandenburg, 2013; Warnecke et al., 2013a,b,c; Rempel et al., 2013; Mantere et al., 2013; Kemel et al., 2013a,b; Losada et al., 2013; Käpylä et al., 2013a,b,c; Svedin et al., 2013; Brandenburg et al., 2013a,b),

49 times in 2012 (Félix et al., 2012; Losada et al., 2012; Peter and Bingert, 2012; Lambrechts and Johansen, 2012; Kahniashvili et al., 2012; Tevzadze et al., 2012; Gibbons et al., 2012; Latter and Papaloizou, 2012; Hubbard, 2012; Gaburov et al., 2012; Yang and Krumholz, 2012; Lyra and Mac Low, 2012; McNally et al., 2012a,b; Bonanno et al., 2012; Haugen et al., 2012; Park and Blackman, 2012a,b; Mantere and Cole, 2012; Rogachevskii et al., 2012; Käpylä et al., 2012a,b; Maron et al., 2012; Horn et al., 2012; Lyra and Kuchner, 2012; Yang et al., 2012; Kitchatinov and Brandenburg, 2012; Brandenburg and Petrosyan, 2012; Hubbard and Brandenburg, 2012; Guerrero et al., 2012; Rice et al., 2012; Kemel et al., 2012a,b; Rheinhardt and Brandenburg, 2012; Peter et al., 2012; Brandenburg and Guerrero, 2012; Brandenburg et al., 2012a,b,c,d; Rempel et al., 2012; Del Sordo et al., 2012; Candelaresi and Brandenburg, 2012; Snellman et al., 2012a,b; Warnecke et al., 2012a,b,c; Johansen et al., 2012),

62 times in 2011 (Gastine and Dintrans, 2011a,b,c; Rice et al., 2011; Käpylä et al., 2011a,b,c; Mantere et al., 2011; Rogachevskii et al., 2011; Lambrechts, 2011; Johansen et al., 2011a,b; Rädler et al., 2011; Tarjei Jensen et al., 2011; Oishi and Mac Low, 2011; Ruoskanen et al., 2011; Fromang et al., 2011; Hydle Rivedal et al., 2011; Guerrero and Käpylä, 2011; Warnecke and Brandenburg, 2011b; Warnecke et al., 2011a,b; Kemel et al., 2011a,b,c; Bejarano et al., 2011; Zacharias et al., 2011a,b; Candelaresi and Brandenburg, 2011a,b; Candelaresi et al., 2011a,b,c; Del Sordo and Brandenburg, 2011a,b; Cantiello et al., 2011a,b; Rempel et al., 2011; Flock et al., 2011; Bingert and Peter, 2011; Käpylä and Korpi, 2011; Johansen et al., 2011c; Rüdiger et al., 2011; Lyra and Klahr, 2011; Mitra et al., 2011; Babkovskaia et al., 2011; Hubbard and Brandenburg, 2011; Chatterjee et al., 2011a,b,c; Chatterjee, 2011; Hubbard et al., 2011; Guerrero et al., 2011; Brandenburg and Nordlund, 2011; Warnecke and Brandenburg, 2011a; Brandenburg et al., 2011a,b,c; Brandenburg, 2011a,b,c,d),

31 times in 2010 (Haugen et al., 2010; Madarassy and Brandenburg, 2010; Gastine and Dintrans, 2010; Kahniashvili et al., 2010; Lyra et al., 2010; Johansen and Lacerda, 2010; Del Sordo et al., 2010; Fromang et al., 2010; Mitra et al., 2010a,b,c; Korpi et al., 2010; Käpylä et al., 2010a,b,c,d; Baggaley et al., 2010; Brandenburg and Dobler, 2010; Guerrero et al., 2010; Chatterjee et al., 2010; Rädler and Brandenburg, 2010; Bingert et al., 2010; Warnecke and Brandenburg, 2010; Hubbard and Brandenburg, 2010; Rheinhardt and Brandenburg, 2010; Brandenburg and Del Sordo, 2010; Brandenburg et al., 2010a,b; Brandenburg, 2010a,b),

35 times in 2009 (Yang et al., 2009; Baggaley et al., 2009; Rempel et al., 2009; Oishi and Mac Low, 2009; Snellman et al., 2009; Børve et al., 2009; Vermersch and Brandenburg, 2009; Heinemann and Papaloizou, 2009; Käpylä and Brandenburg, 2009; Johansen et al., 2009a,b;

Maron and Mac Low, 2009; Zacharias et al., 2009a,b; Fromang et al., 2009; Mitra et al., 2009a,b; Käpylä et al., 2009a,b,c; Liljeström et al., 2009; Lyra et al., 2009a,b; Hubbard and Brandenburg, 2009; Sur and Brandenburg, 2009; Hubbard et al., 2009; Rädler and Brandenburg, 2009; Brandenburg et al., 2009a,b; Brandenburg, 2009a,b,c,d,e,f),

28 times in 2008 (Lyra et al., 2008a,b; Gastine and Dintrans, 2008a,b,c; Johansen and Levin, 2008; Workman and Armitage, 2008; Käpylä and Brandenburg, 2008; Klahr, 2008; Rieu-tord, 2008; Johansen et al., 2008; Yousef et al., 2008; Babkovskaia et al., 2008; Scharmer et al., 2008; Maron et al., 2008; Ruszkowski et al., 2008; Gellert et al., 2008; Rädler and Brandenburg, 2008; Tilgner and Brandenburg, 2008; Sur et al., 2008; Käpylä et al., 2008; Youdin and Johansen, 2008; Green et al., 2008; Brandenburg et al., 2008a,b,c; Brandenburg, 2008a,b),

19 times in 2007 (Käpylä and Brandenburg, 2007; Fromang et al., 2007; Fromang and Papaloizou, 2007; Oishi et al., 2007; Heinemann et al., 2007; Brandenburg and Käpylä, 2007; Schekochihin et al., 2007; Gustafsson et al., 2007; Ruszkowski et al., 2007; Johansen and Youdin, 2007; Youdin and Johansen, 2007; Johansen et al., 2007a,b; Sur et al., 2007; Brandenburg and Subramanian, 2007; Brandenburg et al., 2007a,b; Brandenburg, 2007a,b),

18 times in 2006 (Ouyed et al., 2006; Hupfer et al., 2006; Fromang et al., 2006; de Val-Borro et al., 2006; Haugen and Brandenburg, 2006; Johansen et al., 2006a,b,c; Shukurov et al., 2006; Mee and Brandenburg, 2006; Snodin et al., 2006; Brandenburg and Dintrans, 2006; Gustafsson et al., 2006; Heinemann et al., 2006; Dobler et al., 2006; Brandenburg, 2006a,b,c),

18 times in 2005 (Johansen and Klahr, 2005; McMillan and Sarson, 2005; Schekochihin et al., 2005; Dorch, 2005; Johansen et al., 2005; Christensson et al., 2005; Brandenburg and Rüdiger, 2005; Brandenburg and Blackman, 2005; Brandenburg and Käpylä, 2005; Brandenburg and Subramanian, 2005a,b,c; Brandenburg et al., 2005a,b; Brandenburg, 2005a; Brandenburg et al., 2005c; Brandenburg, 2005b,c,d),

20 times in 2004 (Nordlund, 2004; Brandenburg and Sandin, 2004; Brandenburg and Multamäki, 2004; Dorch, 2004a,b; Haugen and Brandenburg, 2004a,b; Haugen et al., 2004a,b,c; Yousef et al., 2004; Johansen et al., 2004; Maron et al., 2004; Pearson et al., 2004; Brandenburg and Matthaeus, 2004; Dobler and Getling, 2004; Brandenburg et al., 2004a,b,c),

and 7 times in 2003 (Yousef et al., 2003; Yousef and Brandenburg, 2003; McMillan and Sarson, 2003; Haugen et al., 2003; Brandenburg, 2003; Brandenburg et al., 2003; Dobler et al., 2003).

2 Papers by topic

The PENCIL CODE has been used for the following research topics

1. Interstellar and intercluster medium as well as early Universe

- (a) *Interstellar and intercluster medium* (Brandenburg, 2019a; Gent et al., 2018; Zhang and Yan, 2018; Hollins et al., 2017; Hord et al., 2017; Chamandy, 2016; Chamandy et al., 2016; Rodrigues et al., 2016; Gent, 2014; Chamandy et al., 2013; Gent et al., 2013a,b; Bykov et al., 2013; Yang and Krumholz, 2012; Mantere and Cole, 2012; Rogachevskii et al., 2012; Ruoskanen et al., 2011; Ruszkowski et al., 2007, 2008; Brandenburg et al., 2007b; Gustafsson et al., 2006, 2007; Brandenburg et al., 2005a; Haugen et al., 2004b; Brandenburg et al., 2003).
- (b) *Small-scale dynamos and reconnection* (Brandenburg et al., 2018b; Käpylä et al., 2018; Bhat et al., 2016b; Bhat and Subramanian, 2013; Brandenburg, 2011c; Baggaley et al., 2009, 2010; Schekochihin et al., 2005, 2007; Haugen and Brandenburg, 2004b; Haugen et al., 2003, 2004a,c; Dobler et al., 2003).
- (c) *Primordial magnetic fields and decaying turbulence* (Trivedi et al., 2018; Brandenburg et al., 2018a, 2017c,b; Brandenburg and Kahniashvili, 2017; Kahniashvili et al., 2017; Reppin and Banerjee, 2017; Park, 2017; Osano and Adams, 2017; Adams and Osano, 2016; Osano and Adams, 2016c,b,a; Kahniashvili et al., 2016; Brandenburg et al., 2015; Adams and Osano, 2014; Kahniashvili et al., 2012, 2013; Tevzadze et al., 2012; Candelaresi and Brandenburg, 2011a; Kahniashvili et al., 2010; Del Sordo et al., 2010; Christensson et al., 2005; Yousef et al., 2004).

2. Planet formation and inertial particles

- (a) *Planet formation* (Schreiber and Klahr, 2018; Rice and Nayakshin, 2018; Richert et al., 2018; Kuchner et al., 2018; Baehr et al., 2017; Lyra et al., 2016; Yang and Johansen, 2016; Lambrechts et al., 2016; Johansen et al., 2015; Richert et al., 2015; Gibbons et al., 2015; Baehr and Klahr, 2015; Carrera et al., 2015, 2014; Yang and Johansen, 2014a,b; McNally et al., 2014; Turner et al., 2014; Gibbons et al., 2014; Dittrich et al., 2014, 2013; Hubbard, 2013; Lyra and Kuchner, 2013; Gibbons et al., 2012; Hubbard, 2012; Horn et al., 2012; Lyra and Kuchner, 2012; Yang et al., 2012; Lambrechts and Johansen, 2012; Johansen et al., 2012; Fromang et al., 2011; Johansen et al., 2011c; Lambrechts, 2011; Johansen et al., 2011a,b; Lyra and Klahr, 2011; Lyra et al., 2010; Johansen and Lacerda, 2010; Yang et al., 2009; Johansen et al., 2009b; Oishi and Mac Low, 2009; Børve et al., 2009; Lyra et al., 2009a,b, 2008a; Johansen et al., 2008; Lyra et al., 2008b; Youdin and Johansen, 2008; Oishi et al., 2007; Johansen et al., 2007a,b; Johansen and Youdin, 2007; Youdin and Johansen, 2007; Johansen et al., 2006a,b,c; Johansen and Klahr, 2005; Johansen et al., 2004, 2005).
- (b) *Inertial, tracer particles, & passive scalars* (Aarnes et al., 2018; Mitra et al., 2018; Bhatnagar et al., 2018; Aarnes et al., 2017; Li et al., 2017b; Sharma et al., 2017; Haugen et al., 2017; Li et al., 2017a; Krüger et al., 2016; Raettig et al., 2015; Pan and Padoan, 2014, 2013; Pan et al., 2014b,a; Mitra et al., 2013; Haugen et al., 2012; Hydle Rivedal et al., 2011; Haugen et al., 2010).

3. Accretion discs and shear flows

- (a) *Accretion discs and shear flows* (Bhat et al., 2017; Singh et al., 2017; Lyra et al., 2017; Bhat et al., 2016a; Tian and Chen, 2016; Lyra, 2014; Lyra et al., 2015; Väisälä et al., 2014; Lyra, 2013; Raettig et al., 2013; Di Bernardo and Torkelsson, 2013; Latter and Papaloizou, 2012; Gaburov et al., 2012; Lyra and Mac Low, 2012; Rice et al., 2011, 2012; Oishi and Mac Low, 2011; Flock et al., 2011; Käpylä et al., 2010a; Käpylä and Korpi, 2011; Fromang et al., 2010; Korpi et al., 2010; Johansen et al., 2009a; Heinemann and Papaloizou, 2009; Fromang et al., 2009; Johansen and Levin, 2008; Workman and Armitage, 2008; Fromang et al., 2007; Fromang and Papaloizou, 2007; Ouyed et al., 2006; Brandenburg, 2005d).
- (b) *Shear flows* (Singh and Jingade, 2015; Modestov et al., 2014; Vermersch and Brandenburg, 2009; Käpylä et al., 2009c; Green et al., 2008; Yousef et al., 2008; Babkovskaia et al., 2008; Brandenburg et al., 2004a).

4. Solar physics

- (a) *Coronal heating and coronal mass ejections* (Korsós et al., 2018; Cameron et al., 2017; Chatterjee et al., 2016; Candelaresi et al., 2016; Bourdin et al., 2016; Threlfall et al., 2016; Chen et al., 2015; Smiet et al., 2015; Warnecke and Brandenburg, 2014; Bourdin, 2014; Bourdin et al., 2013a,b,c; van Wettum et al., 2013; Bingert and Peter, 2013; Peter and Bingert, 2012; Peter et al., 2012; Warnecke et al., 2012a,b; Warnecke and Brandenburg, 2011a; Zacharias et al., 2011a,b; Warnecke et al., 2011b; Bingert and Peter, 2011; Warnecke and Brandenburg, 2011b; Warnecke et al., 2011a; Warnecke and Brandenburg, 2010; Bingert et al., 2010; Zacharias et al., 2009b,a).
- (b) *Helical dynamos, helical turbulence, and catastrophic quenching* (Bourdin et al., 2018; Bourdin and Brandenburg, 2018; Brandenburg, 2018; Brandenburg and Chatterjee, 2018; Brandenburg et al., 2017d,a,e; Rempel et al., 2017; Smiet et al., 2017; Cole et al., 2016; Karak and Brandenburg, 2016; Karak et al., 2015b; Brandenburg and Hubbard, 2015; Subramanian and Brandenburg, 2014; Brandenburg and Stepanov, 2014; Brandenburg, 2014; Bhat et al., 2014; Chian et al., 2014; Park, 2014b; Park et al., 2013; Brandenburg and Lazarian, 2013; Park, 2013b,a, 2014a; Candelaresi and Brandenburg, 2013a; Park, 2013a; Del Sordo et al., 2013; Brandenburg, 2013; Rempel et al., 2013; Candelaresi and Brandenburg, 2013b, 2012; Brandenburg et al., 2012d; Rempel et al., 2012; Park and Blackman, 2012b,a; Brandenburg and Guerrero, 2012; Brandenburg, 2011a; Hubbard and Brandenburg, 2012; Rempel et al., 2011; Mitra et al., 2011; Candelaresi et al., 2011b; Hubbard and Brandenburg, 2011; Brandenburg, 2011b; Chatterjee et al., 2011a; Hubbard et al., 2011; Candelaresi et al., 2011c; Candelaresi and Brandenburg, 2011b; Candelaresi et al., 2011a; Brandenburg, 2011d; Guerrero et al., 2011; Hubbard and Brandenburg, 2010; Mitra et al., 2010a,b; Brandenburg, 2010b; Guerrero et al., 2010; Brandenburg, 2010a; Brandenburg et al., 2010a; Chatterjee et al., 2010; Rädler and Brandenburg, 2010; Rempel et al., 2009; Käpylä and Brandenburg, 2009; Brandenburg, 2009a,e; Brandenburg et al., 2009a; Brandenburg, 2009d,f; Sur and Brandenburg, 2009; Brandenburg, 2009b,c; Rädler and Brandenburg, 2008; Tilgner

and Brandenburg, 2008; Brandenburg, 2008a; Brandenburg et al., 2008c; Brandenburg, 2008b; Brandenburg and Käpylä, 2007; Brandenburg and Subramanian, 2007; Brandenburg, 2007b,a, 2006c,b; Shukurov et al., 2006; Mee and Brandenburg, 2006; Snodin et al., 2006; Brandenburg and Dintrans, 2006; Brandenburg, 2006a; Brandenburg et al., 2005b; Brandenburg and Subramanian, 2005c,b; Brandenburg and Käpylä, 2005; Brandenburg, 2005a; Brandenburg and Blackman, 2005; Brandenburg and Subramanian, 2005a; Brandenburg, 2005b,c; Brandenburg et al., 2004c; Brandenburg and Matthaeus, 2004; Brandenburg and Sandin, 2004; Yousef and Brandenburg, 2003).

- (c) *Helioseismology* (Singh et al., 2014, 2015).
- (d) *Strongly stratified MHD turbulence and NEMPI* (Losada et al., 2018; Perri and Brandenburg, 2018; Jabbari et al., 2017, 2016; Warnecke et al., 2016a; Jabbari, 2015; Brandenburg et al., 2014; Losada et al., 2014; Mitra et al., 2014; Jabbari and Brandenburg, 2014; Jabbari et al., 2014, 2015; Brandenburg et al., 2013b; Warnecke et al., 2013c; Jabbari et al., 2013; Kemel et al., 2013a,b, 2012a,b, 2011a,b,c; Losada et al., 2013; Käpylä et al., 2013a; Losada et al., 2012; Käpylä et al., 2012a; Brandenburg et al., 2011c, 2012a; Rüdiger et al., 2011; Brandenburg et al., 2010b).
- (e) *Convection in Cartesian domains* (Bushby et al., 2018; Käpylä et al., 2017b; Félix et al., 2013; Käpylä et al., 2013b; Getling, 2013; Félix et al., 2012; Svedin et al., 2013; Guerrero et al., 2012; Gastine and Dintrans, 2011c; Mantere et al., 2011; Käpylä et al., 2011c; Guerrero and Käpylä, 2011; Cantiello et al., 2011a,b; Gastine and Dintrans, 2008a,b, 2010, 2011a,b; Brandenburg et al., 2011b; Käpylä et al., 2008, 2009b, 2010b; Scharmer et al., 2008; Rieutord, 2008; Heinemann et al., 2007, 2006; Nordlund, 2004; Dobler and Getling, 2004).
- (f) *Global convection and dynamo simulations* (Viviani et al., 2017; Käpylä et al., 2017a; Gent et al., 2017; Karak et al., 2015a; Warnecke et al., 2014; Cole et al., 2014; Käpylä et al., 2010d, 2011a,b, 2012b, 2013c, 2014; Mantere et al., 2013; Warnecke et al., 2012c, 2013a,b; Mitra et al., 2009b, 2010c; Brandenburg et al., 2007a; Dobler et al., 2006; McMillan and Sarson, 2005; Dorc, 2004a,b, 2005; McMillan and Sarson, 2003).

5. Miscellaneous

- (a) *Turbulent transport and test-field method* (Warnecke et al., 2016b; Andrievsky et al., 2015; Snellman et al., 2015; Karak et al., 2014; Rheinhardt et al., 2014; Rüdiger and Brandenburg, 2014; Devlen et al., 2013; Brandenburg et al., 2004b, 2008a,b, 2009b, 2012b,c, 2013a; Brandenburg and Rädler, 2013; Snellman et al., 2009, 2012a,b; Kitchatinov and Brandenburg, 2012; Rheinhardt and Brandenburg, 2010, 2012; Rogachevskii et al., 2011; Rädler et al., 2011; Chatterjee, 2011; Brandenburg and Del Sordo, 2010; Madarassy and Brandenburg, 2010; Käpylä et al., 2010c; Hubbard and Brandenburg, 2009; Hubbard et al., 2009; Rädler and Brandenburg, 2009; Käpylä et al., 2009a; Mitra et al., 2009a; Liljeström et al., 2009; Sur et al., 2008; Käpylä and Brandenburg, 2007, 2008; Sur et al., 2007; Hupfer et al., 2006; Yousef et al., 2003).

- (b) *Hydrodynamic and MHD instabilities* (Del Sordo et al., 2012; Chatterjee et al., 2011b,c; Bejarano et al., 2011; Brandenburg and Rüdiger, 2005; Brandenburg et al., 2004c; Brandenburg, 2003).
- (c) *Chiral MHD* (Schober et al., 2018a,b; Brandenburg et al., 2017f).
- (d) *Hydrodynamic turbulence* (Aiyer et al., 2017; Yokoi and Brandenburg, 2016; Brandenburg and Petrosyan, 2012; Del Sordo and Brandenburg, 2011a,b; Brandenburg and Nordlund, 2011; Haugen and Brandenburg, 2004a, 2006; Brandenburg et al., 2005c; Pearson et al., 2004).
- (e) *Turbulent combustion, front propagation, radiation & ionization* (Brandenburg, 2019b; Bhat and Brandenburg, 2016; Babkovskaia et al., 2015; Chaudhuri, 2015; Barekat and Brandenburg, 2014; Tarjei Jensen et al., 2011; Brandenburg et al., 2011a; Babkovskaia et al., 2011; Brandenburg and Multamäki, 2004).
- (f) *Code development (GPU etc)* (Pekkilä et al., 2017).

3 Code comparison & reference

The PENCIL CODE has been quoted in other papers either for detailed code comparison, in connection with related work, or in comparison with other codes (Nixon et al., 2018; Rüdiger et al., 2018; Li et al., 2018; Hernandez et al., 2018; Oishi et al., 2018; Augustson, 2017a; Yamamoto and Makino, 2017; Goffrey et al., 2017; Augustson, 2017b; Ryu and Huynh, 2017; Cabezón et al., 2017; Emeriau-Viard and Brun, 2017; Brun and Browning, 2017; Kupka and Muthsam, 2017; Kulikov et al., 2016; Cabezon et al., 2016; Surville et al., 2016; Simon et al., 2016; Skála et al., 2015; Mocz et al., 2015; Hopkins, 2015; Duffell and MacFadyen, 2015; Krumholz and Forbes, 2015; Cheung et al., 2015; Augustson et al., 2015; Schad et al., 2015; Brun et al., 2015; Norton et al., 2014; Rieutord, 2014; Olshevsky et al., 2014; Skála et al., 2014; Hopkins, 2014; Jenkins et al., 2014; Lovelace and Romanova, 2014; Recchi, 2014; Berera and Linkmann, 2014; Norton et al., 2014; Charbonneau, 2014, 2013; Augustson et al., 2013; Gabbasov et al., 2013; Kulikov, 2013; Fromang, 2013; Martínez Pillet, 2013; Cavecchi et al., 2013; Rein, 2012; Freytag et al., 2012; McNally et al., 2012a; Bonanno et al., 2012; Maron et al., 2012; McNally et al., 2012b; Andic, 2011; Viallet et al., 2011; McNally, 2011; Vshivkov et al., 2011; Ziegler, 2011; Hanasz et al., 2010; Brandenburg and Dobler, 2010; Rovithis-Livaniou, 2010; Bai and Stone, 2010; Stone and Gardiner, 2010; Turck-Chièze, 2010; Garcia de Andrade, 2009; Kley, 2009; Piontek et al., 2009; Maron and Mac Low, 2009; Hawley, 2009; Lemaster and Stone, 2009; Matsumoto and Seki, 2008; Maron et al., 2008; Gellert et al., 2008; Klahr, 2008; Thévenin et al., 2006; Fromang et al., 2006; de Val-Borro et al., 2006; Turner et al., 2006; Rüdiger, 2005; Maron et al., 2004).

References

Aarnes, J. R., Haugen, N. E. L., and Andersson, H. I. (2017). Particle-laden flow past a cylinder resolved with IBM and overset grids. In *APS Division of Fluid Dynamics Meeting Abstracts*, page D37.001.

- Aarnes, J. R., Haugen, N. E. L., and Andersson, H. I. (2018). High-order overset grid method for detecting particle impaction on a cylinder in a cross flow. *ArXiv e-prints*, page arXiv:1805.10039.
- Adams, P. and Osano, B. (2014). Magnetogenesis Experiments Using a Modified Chaplygin Gas EoS. *arXiv:1412.1940*.
- Adams, P. W. M. and Osano, B. (2016). Technical Considerations in Magnetic Analogue Models. *arXiv:1606.06725*.
- Aiyer, A. K., Subramanian, K., and Bhat, P. (2017). Passive scalar mixing and decay at finite correlation times in the Batchelor regime. *Journal of Fluid Mechanics*, 824:785–817.
- Andic, A. (2011). Umbral Dots Observed in Photometric Images Taken with 1.6 m Solar Telescope. *Serb. Astron. J.*, 183:87–94.
- Andrievsky, A., Brandenburg, A., Noullez, A., and Zheligovsky, V. (2015). Negative Magnetic Eddy Diffusivities from the Test-field Method and Multiscale Stability Theory. *Astrophys. J.*, 811:135.
- Augustson, K. (2017a). Dynamos and Differential Rotation: Advances at the Crossroads of Analytics, Numerics, and Observations. In *European Physical Journal Web of Conferences*, volume 160, page 02010.
- Augustson, K. (2017b). Dynamos and Differential Rotation: Advances at the Crossroads of Analytics, Numerics, and Observations. *arXiv:1701.02591*.
- Augustson, K., Brun, A. S., Miesch, M. S., and Toomre, J. (2013). Cycling Dynamo in a Young Sun: Grand Minima and Equatorward Propagation. *arXiv:1310.8417*.
- Augustson, K., Brun, A. S., Miesch, M. S., and Toomre, J. (2015). Grand Minima and Equatorward Propagation in a Cycling Stellar Convective Dynamo. *Astrophys. J.*, 809:149.
- Babkovskaia, N., Boy, M., Smolander, S., Romakkaniemi, S., Rannik, U., and Kulmala, M. (2015). A study of aerosol activation at the cloud edge with high resolution numerical simulations. *Atmospheric Research*, 153:49–58.
- Babkovskaia, N., Brandenburg, A., and Poutanen, J. (2008). Boundary layer on the surface of a neutron star. *Month. Not. Roy. Astron. Soc.*, 386:1038–1044.
- Babkovskaia, N., Haugen, N. E. L., and Brandenburg, A. (2011). A high-order public domain code for direct numerical simulations of turbulent combustion. *J. Comp. Phys.*, 230:1–12.
- Baehr, H. and Klahr, H. (2015). The Role of the Cooling Prescription for Disk Fragmentation: Numerical Convergence and Critical Cooling Parameter in Self-gravitating Disks. *Astrophys. J.*, 814:155.

- Baehr, H., Klahr, H., and Kratter, K. M. (2017). The Fragmentation Criteria in Local Vertically Stratified Self-gravitating Disk Simulations. *Astrophys. J.*, 848:40.
- Baggaley, A. W., Barenghi, C. F., Shukurov, A., and Subramanian, K. (2009). Reconnecting flux-rope dynamo. *Phys. Rev. E*, 80:055301.
- Baggaley, A. W., Shukurov, A., Barenghi, C. F., and Subramanian, K. (2010). Fluctuation dynamo based on magnetic reconnections. *Astron. Nachr.*, 331:46.
- Bai, X.-N. and Stone, J. M. (2010). Dynamics of Solids in the Midplane of Protoplanetary Disks: Implications for Planetesimal Formation. *Astrophys. J.*, 722:1437–1459.
- Barekat, A. and Brandenburg, A. (2014). Near-polytropic stellar simulations with a radiative surface. *Astron. Astrophys.*, 571:A68.
- Bejarano, C., Gómez, D. O., and Brandenburg, A. (2011). Shear-driven Instabilities in Hall-magnetohydrodynamic Plasmas. *Astrophys. J.*, 737:62.
- Berera, A. and Linkmann, M. (2014). Magnetic helicity and the evolution of decaying magnetohydrodynamic turbulence. *Phys. Rev. E*, 90:041003.
- Bhat, P., Blackman, E. G., and Subramanian, K. (2014). Resilience of helical fields to turbulent diffusion - II. Direct numerical simulations. *Month. Not. Roy. Astron. Soc.*, 438:2954–2966.
- Bhat, P. and Brandenburg, A. (2016). Hydraulic effects in a radiative atmosphere with ionization. *Astron. Astrophys.*, 587:A90.
- Bhat, P., Ebrahimi, F., and Blackman, E. G. (2016a). Large-scale dynamo action precedes turbulence in shearing box simulations of the magnetorotational instability. *Month. Not. Roy. Astron. Soc.*, 462:818–829.
- Bhat, P., Ebrahimi, F., Blackman, E. G., and Subramanian, K. (2017). Evolution of the magnetorotational instability on initially tangled magnetic fields. *Month. Not. Roy. Astron. Soc.*, 472:2569–2574.
- Bhat, P. and Subramanian, K. (2013). Fluctuation dynamos and their Faraday rotation signatures. *Month. Not. Roy. Astron. Soc.*, 429:2469–2481.
- Bhat, P., Subramanian, K., and Brandenburg, A. (2016b). A unified large/small-scale dynamo in helical turbulence. *Month. Not. Roy. Astron. Soc.*, 461:240–247.
- Bhatnagar, A., Gustavsson, K., and Mitra, D. (2018). Statistics of the relative velocity of particles in turbulent flows: Monodisperse particles. *Phys. Rev. E*, 97:023105.
- Bingert, S. and Peter, H. (2011). Intermittent heating in the solar corona employing a 3D MHD model. *Astron. Astrophys.*, 530:A112.

- Bingert, S. and Peter, H. (2013). Nanoflare statistics in an active region 3D MHD coronal model. *Astron. Astrophys.*, 550:A30.
- Bingert, S., Zacharias, P., Peter, H., and Gudiksen, B. V. (2010). On the nature of coronal loops above the quiet sun network. *Advances in Space Research*, 45:310–313.
- Bonanno, A., Brandenburg, A., Del Sordo, F., and Mitra, D. (2012). Breakdown of chiral symmetry during saturation of the Tayler instability. *Phys. Rev. E*, 86:016313.
- Børve, S., Speith, R., and Trulsen, J. (2009). Numerical Dissipation in RSPH Simulations of Astrophysical Flows with Application to Protoplanetary Disks. *Astrophys. J.*, 701:1269–1282.
- Bourdin, P.-A. (2014). Standard 1D solar atmosphere as initial condition for MHD simulations and switch-on effects. *Central Europ. Astrophys. Bull.*, 38:1–10.
- Bourdin, P.-A., Bingert, S., and Peter, H. (2013a). 3D-MHD model of a solar active region corona. *VizieR Online Data Catalog*, 355:59123.
- Bourdin, P.-A., Bingert, S., and Peter, H. (2013b). Observationally driven 3D magnetohydrodynamics model of the solar corona above an active region. *Astron. Astrophys.*, 555:A123.
- Bourdin, P.-A., Bingert, S., and Peter, H. (2013c). VizieR Online Data Catalog: 3D-MHD model of a solar active region corona (Bourdin+, 2013). *VizieR Online Data Catalog*, 355.
- Bourdin, P.-A., Bingert, S., and Peter, H. (2016). Scaling laws of coronal loops compared to a 3D MHD model of an active region. *Astron. Astrophys.*, 589:A86.
- Bourdin, P.-A. and Brandenburg, A. (2018). Magnetic helicity from multipolar regions on the solar surface. *ArXiv e-prints*, page arXiv:1804.04160.
- Bourdin, P.-A., Singh, N. K., and Brandenburg, A. (2018). Magnetic helicity reversal in the corona at small plasma beta. *ArXiv e-prints*, page arXiv:1804.04153.
- Brandenburg, A. (2003). *Computational aspects of astrophysical MHD and turbulence*, pages 269–344.
- Brandenburg, A. (2005a). Distributed versus tachocline dynamos. In Lundstedt, H., editor, *Solar activity: exploration, understanding and prediction*, ESA, ESTEC Noordwijk, The Netherlands.
- Brandenburg, A. (2005b). Importance of Magnetic Helicity in Dynamos. In Wielebinski, R. and Beck, R., editors, *Cosmic Magnetic Fields*, volume 664 of *Lecture Notes in Physics*, Berlin Springer Verlag, page 219.
- Brandenburg, A. (2005c). The Case for a Distributed Solar Dynamo Shaped by Near-Surface Shear. *Astrophys. J.*, 625:539–547.
- Brandenburg, A. (2005d). Turbulence and its parameterization in accretion discs. *Astron. Nachr.*, 326:787–797.

- Brandenburg, A. (2006a). Location of the Solar Dynamo and Near-Surface Shear. In Leibacher, J., Stein, R. F., and Uitenbroek, H., editors, *Solar MHD Theory and Observations: A High Spatial Resolution Perspective*, volume 354 of *Astron. Soc. Pac. Conf. Ser.*, page 121.
- Brandenburg, A. (2006b). Magnetic helicity in primordial and dynamo scenarios of galaxies. *Astron. Nachr.*, 327:461.
- Brandenburg, A. (2006c). Why coronal mass ejections are necessary for the dynamo. In *IAU Joint Discussion*, volume 8 of *IAU Joint Discussion*.
- Brandenburg, A. (2007a). Near-surface shear layer dynamics. In Kupka, F., Roxburgh, I., and Chan, K. L., editors, *IAU Symp.*, volume 239 of *IAU Symp.*, pages 457–466.
- Brandenburg, A. (2007b). Why coronal mass ejections are necessary for the dynamo. *Highlights Astron.*, 14:291–292.
- Brandenburg, A. (2008a). The dual role of shear in large-scale dynamos. *Astron. Nachr.*, 329:725.
- Brandenburg, A. (2008b). Turbulent protostellar discs. *Phys. Scripta Vol. T*, 130:014016.
- Brandenburg, A. (2009a). Advances in Theory and Simulations of Large-Scale Dynamos. *Space Sci. Ref.*, 144:87–104.
- Brandenburg, A. (2009b). *Advances in Theory and Simulations of Large-Scale Dynamos*, page 87.
- Brandenburg, A. (2009c). From Fibril to Diffuse Fields During Dynamo Saturation. In Dikpati, M., Arentoft, T., González Hernández, I., Lindsey, C., and Hill, F., editors, *Solar-Stellar Dynamos as Revealed by Helio- and Asteroseismology: GONG 2008/SOHO 21*, volume 416 of *Astron. Soc. Pac. Conf. Ser.*, page 433.
- Brandenburg, A. (2009d). Large-scale Dynamos at Low Magnetic Prandtl Numbers. *Astrophys. J.*, 697:1206–1213.
- Brandenburg, A. (2009e). Paradigm shifts in solar dynamo modeling. In Strassmeier, K. G., Kosovichev, A. G., and Beckman, J. E., editors, *IAU Symp.*, volume 259 of *IAU Symp.*, pages 159–166.
- Brandenburg, A. (2009f). The critical role of magnetic helicity in astrophysical large-scale dynamos. *Plasma Phys. Contr. Fusion*, 51:124043.
- Brandenburg, A. (2010a). Magnetic field evolution in simulations with Euler potentials. *Month. Not. Roy. Astron. Soc.*, 401:347–354.
- Brandenburg, A. (2010b). Surface appearance of dynamo-generated large-scale fields. In *38th COSPAR Scientific Assembly*, volume 38 of *COSPAR Meeting*, page 2826.
- Brandenburg, A. (2011a). Chandrasekhar-Kendall functions in astrophysical dynamos. *Pramana*, 77:67–76.

- Brandenburg, A. (2011b). Dissipation in dynamos at low and high magnetic Prandtl numbers. *Astron. Nachr.*, 332:51.
- Brandenburg, A. (2011c). Nonlinear Small-scale Dynamos at Low Magnetic Prandtl Numbers. *Astrophys. J.*, 741:92.
- Brandenburg, A. (2011d). Simulations of astrophysical dynamos. In Bonanno, A., de Gouveia Dal Pino, E., and Kosovichev, A. G., editors, *IAU Symp.*, volume 274 of *IAU Symp.*, pages 402–409.
- Brandenburg, A. (2013). Non-linear and chaotic dynamo regimes. In Kosovichev, A. G., de Gouveia Dal Pino, E., and Yan, Y., editors, *IAU Symp.*, volume 294 of *IAU Symp.*, pages 387–398.
- Brandenburg, A. (2014). Magnetic Prandtl Number Dependence of the Kinetic-to-magnetic Dissipation Ratio. *Astrophys. J.*, 791:12.
- Brandenburg, A. (2018). Advances in mean-field dynamo theory and applications to astrophysical turbulence. *ArXiv e-prints*, page arXiv:1801.05384.
- Brandenburg, A. (2019a). Ambipolar diffusion in large Prandtl number turbulence. *Month. Not. Roy. Astron. Soc.*, 487(2):2673–2684.
- Brandenburg, A. (2019b). The Limited Roles of Autocatalysis and Enantiomeric Cross-Inhibition in Achieving Homochirality in Dilute Systems. *Origins of Life and Evolution of the Biosphere*, page 17.
- Brandenburg, A., Ashurova, M. B., and Jabbari, S. (2017a). Compensating Faraday Depolarization by Magnetic Helicity in the Solar Corona. *Astrophys. J.*, 845:L15.
- Brandenburg, A. and Blackman, E. G. (2005). Ejection of Bi-Helical Fields from the Sun. *Highlights Astron.*, 13:101.
- Brandenburg, A., Candelaresi, S., and Chatterjee, P. (2009a). Small-scale magnetic helicity losses from a mean-field dynamo. *Month. Not. Roy. Astron. Soc.*, 398:1414–1422.
- Brandenburg, A. and Chatterjee, P. (2018). Strong nonlocality variations in a spherical mean-field dynamo. *Astron. Nachr.*, 339:118–126.
- Brandenburg, A., Chatterjee, P., Del Sordo, F., Hubbard, A., Käpylä, P. J., and Rheinhardt, M. (2010a). Turbulent transport in hydromagnetic flows. *Phys. Scripta Vol. T*, 142:014028.
- Brandenburg, A. and Del Sordo, F. (2010). Turbulent diffusion and galactic magnetism. *Highlights Astron.*, 15:432–433.
- Brandenburg, A. and Dintrans, B. (2006). Nonaxisymmetric stability in the shearing sheet approximation. *Astron. Astrophys.*, 450:437–444.

- Brandenburg, A., Dintrans, B., and Haugen, N. E. L. (2004a). Shearing and embedding box simulations of the magnetorotational instability. In Rosner, R., Rüdiger, G., and Bonanno, A., editors, *MHD Couette Flows: Experiments and Models*, volume 733 of *American Institute of Physics Conference Series*, pages 122–136.
- Brandenburg, A. and Dobler, W. (2010). Pencil Code: Finite-difference Code for Compressible Hydrodynamic Flows. Astrophysics Source Code Library.
- Brandenburg, A., Durrer, R., Kahniashvili, T., Mandal, S., and Yin, W. W. (2018a). Statistical Properties of Scale-Invariant Helical Magnetic Fields and Applications to Cosmology. *ArXiv e-prints*, page arXiv:1804.01177.
- Brandenburg, A., Gressel, O., Jabbari, S., Kleeorin, N., and Rogachevskii, I. (2014). Mean-field and direct numerical simulations of magnetic flux concentrations from vertical field. *Astron. Astrophys.*, 562:A53.
- Brandenburg, A., Gressel, O., Käpylä, P. J., Kleeorin, N., Mantere, M. J., and Rogachevskii, I. (2013a). New scaling for the alpha effect in slowly rotating turbulence. *Astrophys. J.*, 762:127.
- Brandenburg, A. and Guerrero, G. (2012). Cycles and cycle modulations. In Mandrini, C. H. and Webb, D. F., editors, *IAU Symp.*, volume 286 of *IAU Symp.*, pages 37–48.
- Brandenburg, A., Haugen, N., and Mee, A. (2005a). Nonhelical turbulent dynamos: shocks and shear. In Chyzy, K. T., Otmianowska-Mazur, K., Soida, M., and Dettmar, R.-J., editors, *The Magnetized Plasma in Galaxy Evolution*, pages 139–146.
- Brandenburg, A., Haugen, N. E. L., and Babkovskaia, N. (2011a). Turbulent front speed in the Fisher equation: Dependence on Damköhler number. *Phys. Rev. E*, 83:016304.
- Brandenburg, A., Haugen, N. E. L., and Dobler, W. (2003). MHD simulations of small and large scale dynamos. In Erdélyi, R., Petrovay, K., Roberts, B., and Aschwanden, M., editors, *Turbulence, Waves, and Instabilities in the Solar Plasma*, ed. R. Erdélyi, K. Petrovay, B. Roberts, & M. Aschwanden, Kluwer Acad. Publ., Dordrecht, pages 33–53.
- Brandenburg, A., Haugen, N. E. L., Käpylä, P. J., and Sandin, C. (2005b). The problem of small and large scale fields in the solar dynamo. *Astron. Nachr.*, 326:174–185.
- Brandenburg, A., Haugen, N. E. L., Li, X.-Y., and Subramanian, K. (2018b). Varying the forcing scale in low Prandtl number dynamos. *ArXiv e-prints*, page arXiv:1805.01249.
- Brandenburg, A. and Hubbard, P. J., A. K. (2015). Dynamical quenching with non-local α and downward pumping. *Astron. Nachr.*, 336:91–96.
- Brandenburg, A. and Kahniashvili, T. (2017). Classes of Hydrodynamic and Magnetohydrodynamic Turbulent Decay. *Phys. Rev. Lett.*, 118(5):055102.

- Brandenburg, A., Kahniashvili, T., Mandal, S., Pol, A. R., Tevzadze, A. G., and Vachaspati, T. (2017b). Evolution of hydromagnetic turbulence from the electroweak phase transition. *Phys. Rev. D*, 96:123528.
- Brandenburg, A., Kahniashvili, T., Mandal, S., Roper Pol, A., Tevzadze, A. G., and Vachaspati, T. (2017c). The dynamo effect in decaying helical turbulence. *ArXiv e-prints*, page arXiv:1710.01628.
- Brandenburg, A., Kahniashvili, T., and Tevzadze, A. G. (2015). Nonhelical Inverse Transfer of a Decaying Turbulent Magnetic Field. *Phys. Rev. Lett.*, 114:075001.
- Brandenburg, A., Käpylä, P., and Mohammed, A. (2005c). Passive scalar diffusion as a damped wave. In Peinke, J., Kittel, A., Barth, S., and Oberlack, M., editors, *Progress in Turbulence*, Springer-Verlag, pages 3–6.
- Brandenburg, A. and Käpylä, P. J. (2005). Connection between active longitudes and magnetic helicity. *astro-ph/0512639*.
- Brandenburg, A. and Käpylä, P. J. (2007). Magnetic helicity effects in astrophysical and laboratory dynamos. *New J. Phys.*, 9:305.
- Brandenburg, A., Käpylä, P. J., and Korpi, M. J. (2011b). From convective to stellar dynamos. In Brummell, N. H., Brun, A. S., Miesch, M. S., and Ponty, Y., editors, *IAU Symp.*, volume 271 of *IAU Symp.*, pages 279–287.
- Brandenburg, A., Käpylä, P. J., Mitra, D., Moss, D., and Tavakol, R. (2007a). The helicity constraint in spherical shell dynamos. *Astron. Nachr.*, 328:1118.
- Brandenburg, A., Käpylä, P. J., and Mohammed, A. (2004b). Non-Fickian diffusion and tau approximation from numerical turbulence. *Physics of Fluids*, 16:1020–1027.
- Brandenburg, A., Kemel, K., Kleeorin, N., Mitra, D., and Rogachevskii, I. (2011c). Detection of Negative Effective Magnetic Pressure Instability in Turbulence Simulations. *Astrophys. J. Lett.*, 740:L50.
- Brandenburg, A., Kemel, K., Kleeorin, N., and Rogachevskii, I. (2012a). The Negative Effective Magnetic Pressure in Stratified Forced Turbulence. *Astrophys. J.*, 749:179.
- Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2010b). Large-scale magnetic flux concentrations from turbulent stresses. *Astron. Nachr.*, 331:5.
- Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2013b). Self-assembly of Shallow Magnetic Spots through Strongly Stratified Turbulence. *Astrophys. J. Lett.*, 776:L23.
- Brandenburg, A., Korpi, M. J., and Mee, A. J. (2007b). Thermal Instability in Shearing and Periodic Turbulence. *Astrophys. J.*, 654:945–954.

- Brandenburg, A. and Lazarian, A. (2013). Astrophysical Hydromagnetic Turbulence. *Space Sci. Ref.*, 178:163–200.
- Brandenburg, A. and Matthaeus, W. H. (2004). Magnetic helicity evolution in a periodic domain with imposed field. *Phys. Rev. E*, 69:056407.
- Brandenburg, A. and Multamäki, T. (2004). How long can left and right handed life forms coexist? *Int. J. Astrobiology*, 3:209–219.
- Brandenburg, A. and Nordlund, Å. (2011). Astrophysical turbulence modeling. *Rep. Progr. Phys.*, 74:046901.
- Brandenburg, A., Petrie, G. J. D., and Singh, N. K. (2017d). Two-scale Analysis of Solar Magnetic Helicity. *Astrophys. J.*, 836:21.
- Brandenburg, A. and Petrosyan, A. (2012). Kinetic helicity decay in linearly forced turbulence. *Astron. Nachr.*, 333:195.
- Brandenburg, A. and Rädler, K.-H. (2013). Yoshizawa’s cross-helicity effect and its quenching. *Geophysical and Astrophysical Fluid Dynamics*, 107:207–217.
- Brandenburg, A., Rädler, K.-H., and Kemel, K. (2012b). Mean-field transport in stratified and/or rotating turbulence. *Astron. Astrophys.*, 539:A35.
- Brandenburg, A., Rädler, K.-H., and Kemel, K. (2012c). Mean-field transport in stratified and/or rotating turbulence (Corrigendum). *Astron. Astrophys.*, 545:C1.
- Brandenburg, A., Rädler, K.-H., Rheinhardt, M., and Käpylä, P. J. (2008a). Magnetic Diffusivity Tensor and Dynamo Effects in Rotating and Shearing Turbulence. *Astrophys. J.*, 676:740–751.
- Brandenburg, A., Rädler, K.-H., Rheinhardt, M., and Subramanian, K. (2008b). Magnetic Quenching of α and Diffusivity Tensors in Helical Turbulence. *Astrophys. J. Lett.*, 687:L49–L52.
- Brandenburg, A., Rädler, K.-H., and Schinner, M. (2008c). Scale dependence of alpha effect and turbulent diffusivity. *Astron. Astrophys.*, 482:739–746.
- Brandenburg, A. and Rüdiger, G. (2005). The angular momentum transport by the strato-rotational instability in simulated Taylor-Couette flows. *astro-ph/0512409*.
- Brandenburg, A. and Sandin, C. (2004). Catastrophic alpha quenching alleviated by helicity flux and shear. *Astron. Astrophys.*, 427:13–21.
- Brandenburg, A., Sandin, C., and Käpylä, P. J. (2004c). Helical coronal ejections and their role in the solar cycle. In Stepanov, A. V., Benevolenskaya, E. E., and Kosovichev, A. G., editors, *Multi-Wavelength Investigations of Solar Activity*, volume 223 of *IAU Symp.*, pages 57–64.
- Brandenburg, A., Schober, J., and Rogachevskii, I. (2017e). The contribution of kinetic helicity to turbulent magnetic diffusivity. *Astronomische Nachrichten*, 338:790–793.

- Brandenburg, A., Schober, J., Rogachevskii, I., Kahniashvili, T., Boyarsky, A., Fröhlich, J., Ruchayskiy, O., and Kleeorin, N. (2017f). The Turbulent Chiral Magnetic Cascade in the Early Universe. *Astrophys. J.*, 845:L21.
- Brandenburg, A., Sokoloff, D., and Subramanian, K. (2012d). Current Status of Turbulent Dynamo Theory. From Large-Scale to Small-Scale Dynamos. *Space Sci. Ref.*, 169:123–157.
- Brandenburg, A. and Stepanov, R. (2014). Faraday Signature of Magnetic Helicity from Reduced Depolarization. *Astrophys. J.*, 786:91.
- Brandenburg, A. and Subramanian, K. (2005a). Astrophysical magnetic fields and nonlinear dynamo theory. *Phys. Rep.*, 417:1–209.
- Brandenburg, A. and Subramanian, K. (2005b). Minimal tau approximation and simulations of the alpha effect. *Astron. Astrophys.*, 439:835–843.
- Brandenburg, A. and Subramanian, K. (2005c). Strong mean field dynamos require supercritical helicity fluxes. *Astron. Nachr.*, 326:400–408.
- Brandenburg, A. and Subramanian, K. (2007). Simulations of the anisotropic kinetic and magnetic alpha effects. *Astron. Nachr.*, 328:507.
- Brandenburg, A., Svedin, A., and Vasil, G. M. (2009b). Turbulent diffusion with rotation or magnetic fields. *Month. Not. Roy. Astron. Soc.*, 395:1599–1606.
- Brun, A. S. and Browning, M. K. (2017). Magnetism, dynamo action and the solar-stellar connection. *Living Reviews in Solar Physics*, 14:4.
- Brun, A. S., García, R. A., Houdek, G., Nandy, D., and Pinsonneault, M. (2015). The Solar-Stellar Connection. *Space Sci. Ref.*, 196:303–356.
- Bushby, P. J., Käpylä, P. J., Masada, Y., Brandenburg, A., Favier, B., Guervilly, C., and Käpylä, M. J. (2018). Large-scale dynamos in rapidly rotating plane layer convection. *Astron. Astrophys.*, 612:A97.
- Bykov, A. M., Brandenburg, A., Malkov, M. A., and Osipov, S. M. (2013). Microphysics of Cosmic Ray Driven Plasma Instabilities. *Space Sci. Ref.*, 178:201–232.
- Cabezón, R. M., García-Senz, D., and Figueira, J. (2016). Recent advances in the smoothed-particle hydrodynamics technique: Building the code SPHYNX. *arXiv:1607.01698*.
- Cabezón, R. M., García-Senz, D., and Figueira, J. (2017). SPHYNX: an accurate density-based SPH method for astrophysical applications. *Astron. Astrophys.*, 606:A78.
- Cameron, R. H., Dikpati, M., and Brandenburg, A. (2017). The Global Solar Dynamo. *Space Sci. Ref.*, 210:367–395.

- Candelaresi, S. and Brandenburg, A. (2011a). Decay of helical and nonhelical magnetic knots. *Phys. Rev. E*, 84:016406.
- Candelaresi, S. and Brandenburg, A. (2011b). Magnetic helicity fluxes in $\alpha\Omega$ dynamos. In Bonanno, A., de Gouveia Dal Pino, E., and Kosovichev, A. G., editors, *IAU Symp.*, volume 274 of *IAU Symp.*, pages 464–466.
- Candelaresi, S. and Brandenburg, A. (2012). Magnetic helicity fluxes and their effect on stellar dynamos. In Mandrini, C. H. and Webb, D. F., editors, *IAU Symp.*, volume 286 of *IAU Symp.*, pages 49–53.
- Candelaresi, S. and Brandenburg, A. (2013a). Kinetic helicity needed to drive large-scale dynamos. *Phys. Rev. E*, 87:043104.
- Candelaresi, S. and Brandenburg, A. (2013b). Topological constraints on magnetic field relaxation. In Kosovichev, A. G., de Gouveia Dal Pino, E., and Yan, Y., editors, *IAU Symp.*, volume 294 of *IAU Symp.*, pages 353–357.
- Candelaresi, S., Del Sordo, F., and Brandenburg, A. (2011a). Decay of trefoil and other magnetic knots. In Bonanno, A., de Gouveia Dal Pino, E., and Kosovichev, A. G., editors, *IAU Symp.*, volume 274 of *IAU Symp.*, pages 461–463.
- Candelaresi, S., Hubbard, A., Brandenburg, A., and Mitra, D. (2011b). Magnetic helicity transport in the advective gauge family. *Physics of Plasmas*, 18:012903.
- Candelaresi, S., Pontin, D. I., and Hornig, G. (2016). Effects of Field-line Topology on Energy Propagation in the Corona. *Astrophys. J.*, 832:150.
- Candelaresi, S., Sordo, F. D., and Brandenburg, A. (2011c). Influence of Magnetic Helicity in MHD. In Brummell, N. H., Brun, A. S., Miesch, M. S., and Ponty, Y., editors, *IAU Symp.*, volume 271 of *IAU Symp.*, pages 369–370.
- Cantiello, M., Braithwaite, J., Brandenburg, A., Del Sordo, F., Käpylä, P., and Langer, N. (2011a). 3D MHD simulations of subsurface convection in OB stars. In Neiner, C., Wade, G., Meynet, G., and Peters, G., editors, *IAU Symp.*, volume 272 of *IAU Symp.*, pages 32–37.
- Cantiello, M., Braithwaite, J., Brandenburg, A., Del Sordo, F., Käpylä, P., and Langer, N. (2011b). Turbulence and magnetic spots at the surface of hot massive stars. In Prasad Choudhary, D. and Strassmeier, K. G., editors, *IAU Symp.*, volume 273 of *IAU Symp.*, pages 200–203.
- Carrera, D., Johansen, A., and Davies, M. B. (2014). Formation of asteroids from mm-cm sized grains. In Apai, D. and Gabor, P., editors, *Search for Life Beyond the Solar System. Exoplanets, Biosignatures & Instruments*, page P2.13.
- Carrera, D., Johansen, A., and Davies, M. B. (2015). How to form planetesimals from mm-sized chondrules and chondrule aggregates. *Astron. Astrophys.*, 579:A43.

- Cavecchi, Y., Watts, A. L., Braithwaite, J., and Levin, Y. (2013). Flame propagation on the surfaces of rapidly rotating neutron stars during Type I X-ray bursts. *Month. Not. Roy. Astron. Soc.*, 434:3526–3541.
- Chamandy, L. (2016). An analytical dynamo solution for large-scale magnetic fields of galaxies. *Month. Not. Roy. Astron. Soc.*, 462:4402–4415.
- Chamandy, L., Shukurov, A., and Taylor, A. R. (2016). Statistical Tests of Galactic Dynamo Theory. *Astrophys. J.*, 833:43.
- Chamandy, L., Subramanian, K., and Shukurov, A. (2013). Galactic spiral patterns and dynamo action - I. A new twist on magnetic arms. *Month. Not. Roy. Astron. Soc.*, 428:3569–3589.
- Charbonneau, P. (2013). Where is the solar dynamo? *J. Phys. Conf. Ser.*, 440:012014.
- Charbonneau, P. (2014). Solar Dynamo Theory. *Ann. Rev. Astron. Astrophys.*, 52:251–290.
- Chatterjee, P. (2011). Alpha effect due to magnetic buoyancy instability of a horizontal magnetic layer. In *Astron. Soc. India Conf. Ser.*, volume 2 of *Astron. Soc. India Conf. Ser.*, pages 137–142.
- Chatterjee, P., Brandenburg, A., and Guerrero, G. (2010). Can catastrophic quenching be alleviated by separating shear and α effect? *Geophysical and Astrophysical Fluid Dynamics*, 104:591–599.
- Chatterjee, P., Guerrero, G., and Brandenburg, A. (2011a). Magnetic helicity fluxes in interface and flux transport dynamos. *Astron. Astrophys.*, 525:A5.
- Chatterjee, P., Hansteen, V., and Carlsson, M. (2016). Modeling Repeatedly Flaring δ Sunspots. *Phys. Rev. Lett.*, 116:101101.
- Chatterjee, P., Mitra, D., Brandenburg, A., and Rheinhardt, M. (2011b). Spontaneous chiral symmetry breaking by hydromagnetic buoyancy. *Phys. Rev. E*, 84:025403.
- Chatterjee, P., Mitra, D., Rheinhardt, M., and Brandenburg, A. (2011c). Alpha effect due to buoyancy instability of a magnetic layer. *Astron. Astrophys.*, 534:A46.
- Chaudhuri, S. (2015). Pair dispersion of turbulent premixed flame elements. *Phys. Rev. E*, 91:021001.
- Chen, F., Peter, H., Bingert, S., and Cheung, M. C. M. (2015). Magnetic jam in the corona of the Sun. *Nature Physics*, 11:492–495.
- Cheung, M. C. M., Boerner, P., Schrijver, C. J., Testa, P., Chen, F., Peter, H., and Malanushenko, A. (2015). Thermal Diagnostics with the Atmospheric Imaging Assembly on board the Solar Dynamics Observatory: A Validated Method for Differential Emission Measure Inversions. *Astrophys. J.*, 807:143.

- Chian, A. C.-L., Rempel, E. L., Aulanier, G., Schmieder, B., Shadden, S. C., Welsch, B. T., and Yeates, A. R. (2014). Detection of Coherent Structures in Photospheric Turbulent Flows. *Astrophys. J.*, 786:51.
- Christensson, M., Hindmarsh, M., and Brandenburg, A. (2005). Scaling laws in decaying helical hydromagnetic turbulence. *Astron. Nachr.*, 326:393–399.
- Cole, E., Brandenburg, A., Käpylä, P. J., and Käpylä, M. J. (2016). Robustness of oscillatory α^2 dynamos in spherical wedges. *arXiv:1601.05246*.
- Cole, E., Käpylä, P. J., Mantere, M. J., and Brandenburg, A. (2014). An Azimuthal Dynamo Wave in Spherical Shell Convection. *Astrophys. J. Lett.*, 780:L22.
- de Val-Borro, M., Edgar, R. G., Artymowicz, P., Ciecielag, P., Cresswell, P., D’Angelo, G., Delgado-Donate, E. J., Dirksen, G., Fromang, S., Gawryszczak, A., Klahr, H., Kley, W., Lyra, W., Masset, F., Mellema, G., Nelson, R. P., Paardekooper, S.-J., Peplinski, A., Pierens, A., Plewa, T., Rice, K., Schäfer, C., and Speith, R. (2006). A comparative study of disc-planet interaction. *Month. Not. Roy. Astron. Soc.*, 370:529–558.
- Del Sordo, F., Bonanno, A., Brandenburg, A., and Mitra, D. (2012). Spontaneous chiral symmetry breaking in the Tayler instability. In Mandrini, C. H. and Webb, D. F., editors, *IAU Symp.*, volume 286 of *IAU Symp.*, pages 65–69.
- Del Sordo, F. and Brandenburg, A. (2011a). How can vorticity be produced in irrotationally forced flows? In Bonanno, A., de Gouveia Dal Pino, E., and Kosovichev, A. G., editors, *IAU Symp.*, volume 274 of *IAU Symp.*, pages 373–375.
- Del Sordo, F. and Brandenburg, A. (2011b). Vorticity production through rotation, shear, and baroclinicity. *Astron. Astrophys.*, 528:A145.
- Del Sordo, F., Candelaresi, S., and Brandenburg, A. (2010). Magnetic-field decay of three interlocked flux rings with zero linking number. *Phys. Rev. E*, 81:036401.
- Del Sordo, F., Guerrero, G., and Brandenburg, A. (2013). Turbulent dynamos with advective magnetic helicity flux. *Month. Not. Roy. Astron. Soc.*, 429:1686–1694.
- Devlen, E., Brandenburg, A., and Mitra, D. (2013). A mean field dynamo from negative eddy diffusivity. *Month. Not. Roy. Astron. Soc.*, 432:1651–1657.
- Di Bernardo, G. and Torkelsson, U. (2013). Wave modes from the magnetorotational instability in accretion discs. In Zhang, C. M., Belloni, T., Méndez, M., and Zhang, S. N., editors, *IAU Symp.*, volume 290 of *IAU Symp.*, pages 201–202.
- Dittrich, K., Klahr, H., and Johansen, A. (2013). Gravoturbulent Planetesimal Formation: The Positive Effect of Long-lived Zonal Flows. *Astrophys. J.*, 763:117.

- Dittrich, K., Klahr, H., and Johansen, A. (2014). Planetesimal Formation in Zonal Flows Arising in Magneto-Rotationally-Unstable Protoplanetary Disks. In Haghighipour, N., editor, *Formation, Detection, and Characterization of Extrasolar Habitable Planets*, volume 293 of *IAU Symp.*, pages 244–249.
- Dobler, W. and Getling, A. V. (2004). Compressible magnetoconvection as the local producer of solar-type magnetic structures. In Stepanov, A. V., Benevolenskaya, E. E., and Kosovichev, A. G., editors, *Multi-Wavelength Investigations of Solar Activity*, volume 223 of *IAU Symp.*, pages 239–240.
- Dobler, W., Haugen, N. E., Yousef, T. A., and Brandenburg, A. (2003). Bottleneck effect in three-dimensional turbulence simulations. *Phys. Rev. E*, 68:026304.
- Dobler, W., Stix, M., and Brandenburg, A. (2006). Magnetic Field Generation in Fully Convective Rotating Spheres. *Astrophys. J.*, 638:336–347.
- Dorch, S. B. F. (2004a). A Magnetic Betelgeuse? Numerical Simulations of Non-Linear Dynamo Action. In Dupree, A. K. and Benz, A. O., editors, *Stars as Suns : Activity, Evolution and Planets*, volume 219 of *IAU Symp.*, page 656.
- Dorch, S. B. F. (2004b). Magnetic activity in late-type giant stars: Numerical MHD simulations of non-linear dynamo action in Betelgeuse. *Astron. Astrophys.*, 423:1101–1107.
- Dorch, S. B. F. (2005). Dynamo action in late-type giants. In Favata, F., Hussain, G. A. J., and Battrick, B., editors, *13th Cambridge Workshop on Cool Stars, Stellar Systems and the Sun*, volume 560 of *ESA Special Publication*, page 511.
- Duffell, P. C. and MacFadyen, A. I. (2015). High-frequency Voronoi noise reduced by smoothed-mesh motion. *Month. Not. Roy. Astron. Soc.*, 449:2718–2722.
- Emeriau-Viard, C. and Brun, A. S. (2017). Origin and Evolution of Magnetic Field in PMS Stars: Influence of Rotation and Structural Changes. *Astrophys. J.*, 846:8.
- Félix, S., Audit, E., and Dintrans, B. (2012). Pulsations-convection combination in stars. In Boissier, S., de Laverny, P., Nardetto, N., Samadi, R., Valls-Gabaud, D., and Wozniak, H., editors, *SF2A-2012: Proc. Annual Meeting French Soc. Astron. Astrophys.*, pages 329–332.
- Félix, S., Audit, E., and Dintrans, B. (2013). Towards 3D simulations of Cepheids stars. In Cambresy, L., Martins, F., Nuss, E., and Palacios, A., editors, *SF2A-2013: Proceedings of the Annual meeting of the French Society of Astronomy and Astrophysics*, pages 223–226.
- Flock, M., Dzyurkevich, N., Klahr, H., Turner, N. J., and Henning, T. (2011). Turbulence and Steady Flows in Three-dimensional Global Stratified Magnetohydrodynamic Simulations of Accretion Disks. *Astrophys. J.*, 735:122.
- Freytag, B., Steffen, M., Ludwig, H.-G., Wedemeyer-Böhm, S., Schaffenberger, W., and Steiner, O. (2012). Simulations of stellar convection with CO5BOLD. *J. Comp. Phys.*, 231:919–959.

- Fromang, S. (2013). MRI-driven angular momentum transport in protoplanetary disks. In *EAS Publications Series*, volume 62 of *EAS Publications Series*, pages 95–142.
- Fromang, S., Hennebelle, P., and Teyssier, R. (2006). A high order Godunov scheme with constrained transport and adaptive mesh refinement for astrophysical magnetohydrodynamics. *Astron. Astrophys.*, 457:371–384.
- Fromang, S., Lyra, W., and Masset, F. (2011). Meridional circulation in turbulent protoplanetary disks. *Astron. Astrophys.*, 534:A107.
- Fromang, S. and Papaloizou, J. (2007). MHD simulations of the magnetorotational instability in a shearing box with zero net flux. I. The issue of convergence. *Astron. Astrophys.*, 476:1113–1122.
- Fromang, S., Papaloizou, J., Lesur, G., and Heinemann, T. (2007). MHD simulations of the magnetorotational instability in a shearing box with zero net flux. II. The effect of transport coefficients. *Astron. Astrophys.*, 476:1123–1132.
- Fromang, S., Papaloizou, J., Lesur, G., and Heinemann, T. (2009). Numerical Simulations of MHD Turbulence in Accretion Disks. In Pogorelov, N. V., Audit, E., Colella, P., and Zank, G. P., editors, *Numerical Modeling of Space Plasma Flows: ASTRONUM-2008*, volume 406 of *Astron. Soc. Pac. Conf. Ser.*, page 9.
- Fromang, S., Papaloizou, J., Lesur, G., and Heinemann, T. (2010). MHD turbulence in accretion disks: the importance of the magnetic Prandtl number. In Montmerle, T., Ehrenreich, D., and Lagrange, A.-M., editors, *EAS Publications Series*, volume 41 of *EAS Publications Series*, pages 167–170.
- Gabbasov, R. F., Klapp-Escribano, J., Suarez-Cansino, J., and Sigalotti, L. D. G. (2013). Numerical simulations of the Kelvin-Helmholtz instability with the Gadget-2 SPH code. *arXiv:1310.3859*.
- Gaburov, E., Johansen, A., and Levin, Y. (2012). Magnetically Levitating Accretion Disks around Supermassive Black Holes. *Astrophys. J.*, 758:103.
- Garcia de Andrade, L. (2009). Magnetic field reversals and topological entropy in non-geodesic hyperbolic dynamos. *arXiv:0911.0218*.
- Gastine, T. and Dintrans, B. (2008a). Direct numerical simulations of the κ -mechanism. I. Radial modes in the purely radiative case. *Astron. Astrophys.*, 484:29–42.
- Gastine, T. and Dintrans, B. (2008b). Direct numerical simulations of the κ -mechanism. II. Nonlinear saturation and the Hertzsprung progression. *Astron. Astrophys.*, 490:743–752.
- Gastine, T. and Dintrans, B. (2008c). DNS of the kappa-mechanism. *arXiv:0809.4949*.
- Gastine, T. and Dintrans, B. (2010). Numerical simulations of the κ -mechanism with convection. *Astrophys. Space Sci.*, 328:245–251.

- Gastine, T. and Dintrans, B. (2011a). A test of time-dependent theories of stellar convection. *Astron. Astrophys.*, 530:L7.
- Gastine, T. and Dintrans, B. (2011b). Convective quenching of stellar pulsations. *Astron. Astrophys.*, 528:A6.
- Gastine, T. and Dintrans, B. (2011c). Nonlinear simulations of the convection-pulsation coupling. In Alecian, G., Belkacem, K., Samadi, R., and Valls-Gabaud, D., editors, *SF2A-2012: Proc. Annual Meeting French Soc. Astron. Astrophys.*, pages 215–219.
- Gellert, M., Rüdiger, G., and Elstner, D. (2008). Helicity generation and α -effect by Tayler instability with z-dependent differential rotation. *Astron. Astrophys.*, 479:L33–L36.
- Gent, F. (2014). Supernovae driven turbulence in the interstellar medium. *arXiv:1408.0446*.
- Gent, F. A., Käpylä, M. J., and Warnecke, J. (2017). Long-term variations of turbulent transport coefficients in a solarlike convective dynamo simulation. *Astronomische Nachrichten*, 338:885–895.
- Gent, F. A., Mac Low, M.-M., Käpylä, M. J., Sarson, G. R., and Hollins, J. F. (2018). Pencil-Code special edition: modelling supernova driven turbulence. *ArXiv e-prints*, page arXiv:1806.01570.
- Gent, F. A., Shukurov, A., Fletcher, A., Sarson, G. R., and Mantere, M. J. (2013a). The supernova-regulated ISM - I. The multiphase structure. *Month. Not. Roy. Astron. Soc.*, 432:1396–1423.
- Gent, F. A., Shukurov, A., Sarson, G. R., Fletcher, A., and Mantere, M. J. (2013b). The supernova-regulated ISM - II. The mean magnetic field. *Month. Not. Roy. Astron. Soc.*, 430:L40–L44.
- Getling, A. V. (2013). The flow helicity in quasi-ordered cellular convection. In Kosovichev, A. G., de Gouveia Dal Pino, E., and Yan, Y., editors, *IAU Symp.*, volume 294 of *IAU Symp.*, pages 359–360.
- Gibbons, P. G., Mamatsashvili, G. R., and Rice, W. K. M. (2014). Planetesimal formation in self-gravitating discs - the effects of particle self-gravity and back-reaction. *Month. Not. Roy. Astron. Soc.*, 442:361–371.
- Gibbons, P. G., Mamatsashvili, G. R., and Rice, W. K. M. (2015). Planetesimal formation in self-gravitating discs - dust trapping by vortices. *Month. Not. Roy. Astron. Soc.*, 453:4232–4243.
- Gibbons, P. G., Rice, W. K. M., and Mamatsashvili, G. R. (2012). Planetesimal formation in self-gravitating discs. *Month. Not. Roy. Astron. Soc.*, 426:1444–1454.
- Goffrey, T., Pratt, J., Viallet, M., Baraffe, I., Popov, M. V., Walder, R., Folini, D., Geroux, C., and Constantino, T. (2017). Benchmarking the Multidimensional Stellar Implicit Code MUSIC. *Astron. Astrophys.*, 600:A7.

- Green, C., Brandenburg, A., and Kosovichev, A. (2008). Non-linear Modeling of Wavelike Behaviour of Supergranulation. *AGU Spring Meeting Abstracts*.
- Guerrero, G., Chatterjee, P., and Brandenburg, A. (2010). Shear-driven and diffusive helicity fluxes in $\alpha\Omega$ dynamos. *Month. Not. Roy. Astron. Soc.*, 409:1619–1630.
- Guerrero, G. and Käpylä, P. J. (2011). Dynamo action and magnetic buoyancy in convection simulations with vertical shear. *Astron. Astrophys.*, 533:A40.
- Guerrero, G., Rheinhardt, M., Brandenburg, A., and Dikpati, M. (2011). Theoretical comparison of plasma and magnetic feature tracking (MFT) flows: a perspective for assimilating meridional flow data in flux-transport models. *AGU Fall Meeting Abstracts*, page A3.
- Guerrero, G., Rheinhardt, M., Brandenburg, A., and Dikpati, M. (2012). Plasma flow versus magnetic feature-tracking speeds in the Sun. *Month. Not. Roy. Astron. Soc.*, 420:L1–L5.
- Gustafsson, M., Brandenburg, A., Lemaire, J. L., and Field, D. (2006). The nature of turbulence in OMC1 at the scale of star formation: observations and simulations. *Astron. Astrophys.*, 454:815–825.
- Gustafsson, M., Brandenburg, A., Lemaire, J.-L., and Field, D. (2007). Probing turbulence in OMC1 at the star forming scale: observations and simulations. In Elmegreen, B. G. and Palous, J., editors, *IAU Symp.*, volume 237 of *IAU Symp.*, pages 183–187.
- Hanasz, M., Kowalik, K., Wóltański, D., and Pawłaszek, R. (2010). The PIERNIK MHD code - a multi-fluid, non-ideal extension of the relaxing-TVD scheme (I). In Goździewski, K., Niedzielski, A., and Schneider, J., editors, *EAS Publications Series*, volume 42 of *EAS Publications Series*, pages 275–280.
- Haugen, N. E., Brandenburg, A., and Dobler, W. (2004a). Simulations of nonhelical hydromagnetic turbulence. *Phys. Rev. E*, 70:016308.
- Haugen, N. E. L. and Brandenburg, A. (2004a). Inertial range scaling in numerical turbulence with hyperviscosity. *Phys. Rev. E*, 70:026405.
- Haugen, N. E. L. and Brandenburg, A. (2004b). Suppression of small scale dynamo action by an imposed magnetic field. *Phys. Rev. E*, 70:036408.
- Haugen, N. E. L. and Brandenburg, A. (2006). Hydrodynamic and hydromagnetic energy spectra from large eddy simulations. *Physics of Fluids*, 18:075106.
- Haugen, N. E. L., Brandenburg, A., and Dobler, W. (2003). Is Nonhelical Hydromagnetic Turbulence Peaked at Small Scales? *Astrophys. J. Lett.*, 597:L141–L144.
- Haugen, N. E. L., Brandenburg, A., and Dobler, W. (2004b). High-Resolution Simulations of Nonhelical MHD Turbulence. *Astrophys. Space Sci.*, 292:53–60.

- Haugen, N. E. L., Brandenburg, A., and Mee, A. J. (2004c). Mach number dependence of the onset of dynamo action. *Month. Not. Roy. Astron. Soc.*, 353:947–952.
- Haugen, N. E. L., Kleeorin, N., Rogachevskii, I., and Brandenburg, A. (2012). Detection of turbulent thermal diffusion of particles in numerical simulations. *Physics of Fluids*, 24:075106.
- Haugen, N. E. L., Kragset, S., Bugge, M., Warnecke, R., and Weghaus, M. (2010). Particle impaction efficiency and size distribution in a MSWI super heater tube bundle. *arXiv:1008.5040*.
- Haugen, N. E. L., Kruger, J., Mitra, D., and Løvås, T. (2017). The effect of turbulence on mass and heat transfer rates of small inertial particles. *arXiv:1701.04567*.
- Hawley, J. F. (2009). MHD simulations of accretion disks and jets: strengths and limitations. *Astrophys. Space Sci.*, 320:107–114.
- Heinemann, T., Dobler, W., Nordlund, Å., and Brandenburg, A. (2006). Radiative transfer in decomposed domains. *Astron. Astrophys.*, 448:731–737.
- Heinemann, T., Nordlund, Å., Scharmer, G. B., and Spruit, H. C. (2007). MHD Simulations of Penumbra Fine Structure. *Astrophys. J.*, 669:1390–1394.
- Heinemann, T. and Papaloizou, J. C. B. (2009). The excitation of spiral density waves through turbulent fluctuations in accretion discs - II. Numerical simulations with MRI-driven turbulence. *Month. Not. Roy. Astron. Soc.*, 397:64–74.
- Hernandez, B., Geogdzhayeva, M., Beltre, C., Ocasio, A., Skarbinski, M., Zbib, D., Swar, P., and Mac Low, M. (2018). BridgeUP: STEM and Learning Astrophysics Interactively. In *American Astronomical Society Meeting Abstracts*.
- Hollins, J. F., Sarson, G. R., Shukurov, A., Fletcher, A., and Gent, F. A. (2017). Supernova-regulated ISM. V. Space and Time Correlations. *Astrophys. J.*, 850:4.
- Hopkins, P. F. (2014). GIZMO: A New Class of Accurate, Mesh-Free Hydrodynamic Simulation Methods. *arXiv:1409.7395*.
- Hopkins, P. F. (2015). A new class of accurate, mesh-free hydrodynamic simulation methods. *Month. Not. Roy. Astron. Soc.*, 450:53–110.
- Hord, B., Lyra, W., Flock, M., Turner, N. J., and Mac Low, M.-M. (2017). On Shocks Driven by High-mass Planets in Radiatively Inefficient Disks. III. Observational Signatures in Thermal Emission and Scattered Light. *Astrophys. J.*, 849:164.
- Horn, B., Lyra, W., Mac Low, M.-M., and Sándor, Z. (2012). Orbital Migration of Interacting Low-mass Planets in Evolutionary Radiative Turbulent Models. *Astrophys. J.*, 750:34.
- Hubbard, A. (2012). Turbulence-induced collisional velocities and density enhancements: large inertial range results from shell models. *Month. Not. Roy. Astron. Soc.*, 426:784–795.

- Hubbard, A. (2013). High Temperature Mineral Formation by Short Circuits in Protoplanetary Disks. NASA Proposal #13-OSS13-80.
- Hubbard, A. and Brandenburg, A. (2009). Memory Effects in Turbulent Transport. *Astrophys. J.*, 706:712–726.
- Hubbard, A. and Brandenburg, A. (2010). Magnetic helicity fluxes in an α^2 dynamo embedded in a halo. *Geophysical and Astrophysical Fluid Dynamics*, 104:577–590.
- Hubbard, A. and Brandenburg, A. (2011). Magnetic Helicity Flux in the Presence of Shear. *Astrophys. J.*, 727:11.
- Hubbard, A. and Brandenburg, A. (2012). Catastrophic Quenching in $\alpha\Omega$ Dynamos Revisited. *Astrophys. J.*, 748:51.
- Hubbard, A., Del Sordo, F., Käpylä, P. J., and Brandenburg, A. (2009). The α effect with imposed and dynamo-generated magnetic fields. *Month. Not. Roy. Astron. Soc.*, 398:1891–1899.
- Hubbard, A., Rheinhardt, M., and Brandenburg, A. (2011). The fratricide of $\alpha\Omega$ dynamos by their α^2 siblings. *Astron. Astrophys.*, 535:A48.
- Hupfer, C., Käpylä, P. J., and Stix, M. (2006). Reynolds stresses and meridional circulation from rotating cylinder simulations. *Astron. Astrophys.*, 459:935–944.
- Hydly Rivedal, N., Granskogen Bjørnstad, A., and Haugen, N. E. L. (2011). The effect of turbulence on the particle impaction on a cylinder in a cross flow. *arXiv:1109.1135*.
- Jabbari, S. (2015). Magnetic Flux Concentrations in Stratified Turbulent Plasma Due to Negative Effective Magnetic Pressure Instability. *IAU General Assembly*, 22:2254998.
- Jabbari, S. and Brandenburg, A. (2014). Magnetic Flux Concentrations in Stratified Turbulent Plasma Due to Negative Effective Magnetic Pressure Instability. *AGU Fall Meeting Abstracts*.
- Jabbari, S., Brandenburg, A., Kleeorin, N., Mitra, D., and Rogachevskii, I. (2013). Surface flux concentrations in a spherical α^2 dynamo. *Astron. Astrophys.*, 556:A106.
- Jabbari, S., Brandenburg, A., Kleeorin, N., Mitra, D., and Rogachevskii, I. (2015). Bipolar Magnetic Spots from Dynamos in Stratified Spherical Shell Turbulence. *Astrophys. J.*, 805:166.
- Jabbari, S., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2017). Sharp magnetic structures from dynamos with density stratification. *Month. Not. Roy. Astron. Soc.*, 467:2753–2765.
- Jabbari, S., Brandenburg, A., Losada, I. R., Kleeorin, N., and Rogachevskii, I. (2014). Magnetic flux concentrations from dynamo-generated fields. *Astron. Astrophys.*, 568:A112.
- Jabbari, S., Brandenburg, A., Mitra, D., Kleeorin, N., and Rogachevskii, I. (2016). Turbulent reconnection of magnetic bipoles in stratified turbulence. *Month. Not. Roy. Astron. Soc.*, 459:4046–4056.

- Jenkins, I., Challis, C. D., Keeling, D. L., and Surrey, E. (2014). Scoping Studies for NBI Launch Geometries on DEMO. *arXiv:1403.6349*.
- Johansen, A., Andersen, A. C., and Brandenburg, A. (2004). Simulations of dust-trapping vortices in protoplanetary discs. *Astron. Astrophys.*, 417:361–374.
- Johansen, A., Brauer, F., Dullemond, C., Klahr, H., and Henning, T. (2008). A coagulation-fragmentation model for the turbulent growth and destruction of preplanetesimals. *Astron. Astrophys.*, 486:597–611.
- Johansen, A., Henning, T., and Klahr, H. (2006a). Dust Sedimentation and Self-sustained Kelvin-Helmholtz Turbulence in Protoplanetary Disk Midplanes. *Astrophys. J.*, 643:1219–1232.
- Johansen, A., Kato, M., and Sano, T. (2011a). A new viscous instability in weakly ionised protoplanetary discs. In Bonanno, A., de Gouveia Dal Pino, E., and Kosovichev, A. G., editors, *Advances in Plasma Astrophysics*, volume 274 of *IAU Symp.*, pages 50–55.
- Johansen, A. and Klahr, H. (2005). Dust Diffusion in Protoplanetary Disks by Magnetorotational Turbulence. *Astrophys. J.*, 634:1353–1371.
- Johansen, A., Klahr, H., and Henning, T. (2005). Gravoturbulent Formation of Planetesimals. In *Protostars and Planets V*, page 8004.
- Johansen, A., Klahr, H., and Henning, T. (2006b). Gravoturbulent Formation of Planetesimals. *Astrophys. J.*, 636:1121–1134.
- Johansen, A., Klahr, H., and Henning, T. (2011b). High-resolution simulations of planetesimal formation in turbulent protoplanetary discs. In Sozzetti, A., Lattanzi, M. G., and Boss, A. P., editors, *The Astrophysics of Planetary Systems: Formation, Structure, and Dynamical Evolution*, volume 276 of *IAU Symp.*, pages 89–94.
- Johansen, A., Klahr, H., and Henning, T. (2011c). High-resolution simulations of planetesimal formation in turbulent protoplanetary discs. *Astron. Astrophys.*, 529:A62.
- Johansen, A., Klahr, H., and Mee, A. J. (2006c). Turbulent diffusion in protoplanetary discs: the effect of an imposed magnetic field. *Month. Not. Roy. Astron. Soc.*, 370:L71–L75.
- Johansen, A. and Lacerda, P. (2010). Prograde rotation of protoplanets by accretion of pebbles in a gaseous environment. *Month. Not. Roy. Astron. Soc.*, 404:475–485.
- Johansen, A. and Levin, Y. (2008). High accretion rates in magnetised Keplerian discs mediated by a Parker instability driven dynamo. *Astron. Astrophys.*, 490:501–514.
- Johansen, A., Mac Low, M.-M., Lacerda, P., and Bizzarro, M. (2015). Growth of asteroids, planetary embryos, and Kuiper belt objects by chondrule accretion. *Science Advances*, 1:1500109.
- Johansen, A., Oishi, J. S., Mac Low, M.-M., Klahr, H., Henning, T., and Youdin, A. (2007a). Rapid planetesimal formation in turbulent circumstellar disks. *Nature*, 448:1022–1025.

- Johansen, A., Oishi, J. S., Mac Low, M.-M., Klahr, H., Henning, T., and Youdin, A. (2007b). Supplementary Information for “Rapid planetesimal formation in turbulent circumstellar discs”. *arXiv:0708.3893*.
- Johansen, A. and Youdin, A. (2007). Protoplanetary Disk Turbulence Driven by the Streaming Instability: Nonlinear Saturation and Particle Concentration. *Astrophys. J.*, 662:627–641.
- Johansen, A., Youdin, A., and Klahr, H. (2009a). Zonal Flows and Long-lived Axisymmetric Pressure Bumps in Magnetorotational Turbulence. *Astrophys. J.*, 697:1269–1289.
- Johansen, A., Youdin, A., and Mac Low, M.-M. (2009b). Particle Clumping and Planetesimal Formation Depend Strongly on Metallicity. *Astrophys. J. Lett.*, 704:L75–L79.
- Johansen, A., Youdin, A. N., and Lithwick, Y. (2012). Adding particle collisions to the formation of asteroids and Kuiper belt objects via streaming instabilities. *Astron. Astrophys.*, 537:A125.
- Kahniashvili, T., Brandenburg, A., Campanelli, L., Ratra, B., and Tevzadze, A. G. (2012). Evolution of inflation-generated magnetic field through phase transitions. *Phys. Rev. D*, 86:103005.
- Kahniashvili, T., Brandenburg, A., Durrer, R., Tevzadze, A. G., and Yin, W. (2017). Scale-invariant helical magnetic field evolution and the duration of inflation. *Journal of Cosmology and Astro-Particle Physics*, 2017:002.
- Kahniashvili, T., Brandenburg, A., and Tevzadze, A. G. (2016). The evolution of primordial magnetic fields since their generation. *Phys. Scr.*, 91(10):104008.
- Kahniashvili, T., Brandenburg, A., Tevzadze, A. G., and Ratra, B. (2010). Numerical simulations of the decay of primordial magnetic turbulence. *Phys. Rev. D*, 81:123002.
- Kahniashvili, T., Tevzadze, A. G., Brandenburg, A., and Neronov, A. (2013). Evolution of primordial magnetic fields from phase transitions. *Phys. Rev. D*, 87:083007.
- Käpylä, P. J. and Brandenburg, A. (2007). Turbulent viscosity and Λ -effect from numerical turbulence models. *Astron. Nachr.*, 328:1006–1008.
- Käpylä, P. J. and Brandenburg, A. (2008). Lambda effect from forced turbulence simulations. *Astron. Astrophys.*, 488:9–23.
- Käpylä, P. J. and Brandenburg, A. (2009). Turbulent Dynamos with Shear and Fractional Helicity. *Astrophys. J.*, 699:1059–1066.
- Käpylä, P. J., Brandenburg, A., Kleeorin, N., Mantere, M. J., and Rogachevskii, I. (2012a). Negative effective magnetic pressure in turbulent convection. *Month. Not. Roy. Astron. Soc.*, 422:2465–2473.
- Käpylä, P. J., Brandenburg, A., Kleeorin, N., Mantere, M. J., and Rogachevskii, I. (2013a). Flux concentrations in turbulent convection. In Kosovichev, A. G., de Gouveia Dal Pino, E., and Yan, Y., editors, *IAU Symp.*, volume 294 of *IAU Symp.*, pages 283–288.

- Käpylä, P. J., Brandenburg, A., Korpi, M. J., Snellman, J. E., and Narayan, R. (2010a). Angular Momentum Transport in Convectively Unstable Shear Flows. *Astrophys. J.*, 719:67–76.
- Käpylä, P. J., Käpylä, M. J., and Brandenburg, A. (2014). Confirmation of bistable stellar differential rotation profiles. *Astron. Astrophys.*, 570:A43.
- Käpylä, P. J., Käpylä, M. J., and Brandenburg, A. (2018). Small-scale dynamos in simulations of stratified turbulent convection. *Astron. Nachr.*, 339:127–133.
- Käpylä, P. J., Käpylä, M. J., Olsper, N., Warnecke, J., and Brandenburg, A. (2017a). Convection-driven spherical shell dynamos at varying Prandtl numbers. *Astron. Astrophys.*, 599:A4.
- Käpylä, P. J. and Korpi, M. J. (2011). Magnetorotational instability driven dynamos at low magnetic Prandtl numbers. *Month. Not. Roy. Astron. Soc.*, 413:901–907.
- Käpylä, P. J., Korpi, M. J., and Brandenburg, A. (2008). Large-scale dynamos in turbulent convection with shear. *Astron. Astrophys.*, 491:353–362.
- Käpylä, P. J., Korpi, M. J., and Brandenburg, A. (2009a). Alpha effect and turbulent diffusion from convection. *Astron. Astrophys.*, 500:633–646.
- Käpylä, P. J., Korpi, M. J., and Brandenburg, A. (2009b). Large-scale Dynamos in Rigidly Rotating Turbulent Convection. *Astrophys. J.*, 697:1153–1163.
- Käpylä, P. J., Korpi, M. J., and Brandenburg, A. (2010b). Open and closed boundaries in large-scale convective dynamos. *Astron. Astrophys.*, 518:A22.
- Käpylä, P. J., Korpi, M. J., and Brandenburg, A. (2010c). The α effect in rotating convection with sinusoidal shear. *Month. Not. Roy. Astron. Soc.*, 402:1458–1466.
- Käpylä, P. J., Korpi, M. J., Brandenburg, A., Mitra, D., and Tavakol, R. (2010d). Convective dynamos in spherical wedge geometry. *Astron. Nachr.*, 331:73.
- Käpylä, P. J., Mantere, M. J., and Brandenburg, A. (2011a). Effects of stratification in spherical shell convection. *Astron. Nachr.*, 332:883.
- Käpylä, P. J., Mantere, M. J., and Brandenburg, A. (2012b). Cyclic Magnetic Activity due to Turbulent Convection in Spherical Wedge Geometry. *Astrophys. J. Lett.*, 755:L22.
- Käpylä, P. J., Mantere, M. J., and Brandenburg, A. (2013b). Oscillatory large-scale dynamos from Cartesian convection simulations. *Geophysical and Astrophysical Fluid Dynamics*, 107:244–257.
- Käpylä, P. J., Mantere, M. J., Cole, E., Warnecke, J., and Brandenburg, A. (2013c). Effects of Enhanced Stratification on Equatorward Dynamo Wave Propagation. *Astrophys. J.*, 778:41.
- Käpylä, P. J., Mantere, M. J., Guerrero, G., Brandenburg, A., and Chatterjee, P. (2011b). Reynolds stress and heat flux in spherical shell convection. *Astron. Astrophys.*, 531:A162.

- Käpylä, P. J., Mantere, M. J., and Hackman, T. (2011c). Starspots due to Large-scale Vortices in Rotating Turbulent Convection. *Astrophys. J.*, 742:34.
- Käpylä, P. J., Mitra, D., and Brandenburg, A. (2009c). Numerical study of large-scale vorticity generation in shear-flow turbulence. *Phys. Rev. E*, 79:016302.
- Käpylä, P. J., Rheinhardt, M., Brandenburg, A., Arlt, R., Käpylä, M. J., Lagg, A., Olsper, N., and Warnecke, J. (2017b). Extended Subadiabatic Layer in Simulations of Overshooting Convection. *Astrophys. J.*, 845:L23.
- Karak, B. B. and Brandenburg, A. (2016). Is the Small-scale Magnetic Field Correlated with the Dynamo Cycle? *Astrophys. J.*, 816:28.
- Karak, B. B., Käpylä, P. J., Käpylä, M. J., Brandenburg, A., Olsper, N., and Pelt, J. (2015a). Magnetically controlled stellar differential rotation near the transition from solar to anti-solar profiles. *Astron. Astrophys.*, 576:A26.
- Karak, B. B., Kitchatinov, L. L., and Brandenburg, A. (2015b). Hysteresis between Distinct Modes of Turbulent Dynamos. *Astrophys. J.*, 803:95.
- Karak, B. B., Rheinhardt, M., Brandenburg, A., Käpylä, P. J., and Käpylä, M. J. (2014). Quenching and Anisotropy of Hydromagnetic Turbulent Transport. *Astrophys. J.*, 795:16.
- Kemel, K., Brandenburg, A., and Ji, H. (2011a). Model of driven and decaying magnetic turbulence in a cylinder. *Phys. Rev. E*, 84:056407.
- Kemel, K., Brandenburg, A., Kleeorin, N., Mitra, D., and Rogachevskii, I. (2012a). Spontaneous Formation of Magnetic Flux Concentrations in Stratified Turbulence. *Sol. Phys.*, 280:321–333.
- Kemel, K., Brandenburg, A., Kleeorin, N., Mitra, D., and Rogachevskii, I. (2013a). Active Region Formation through the Negative Effective Magnetic Pressure Instability. *Sol. Phys.*, 287:293–313.
- Kemel, K., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2011b). The negative magnetic pressure effect in stratified turbulence. In Prasad Choudhary, D. and Strassmeier, K. G., editors, *IAU Symp.*, volume 273 of *IAU Symp.*, pages 83–88.
- Kemel, K., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2011c). Turbulent magnetic pressure instability in stratified turbulence. In Bonanno, A., de Gouveia Dal Pino, E., and Kosovichev, A. G., editors, *IAU Symp.*, volume 274 of *IAU Symp.*, pages 473–475.
- Kemel, K., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2012b). Properties of the negative effective magnetic pressure instability. *Astron. Nachr.*, 333:95.
- Kemel, K., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2013b). Non-uniformity effects in the negative effective magnetic pressure instability. *Phys. Scripta Vol. T*, 155:014027.

- Kitchatinov, L. L. and Brandenburg, A. (2012). Transport of angular momentum and chemical species by anisotropic mixing in stellar radiative interiors. *Astron. Nachr.*, 333:230.
- Klahr, H. (2008). From boulders to planetary systems. *New Astron. Rev.*, 52:78–93.
- Kley, W. (2009). Modelling the evolution of planets in disks. *arXiv:0910.4386*.
- Korpi, M. J., Käpylä, P. J., and Väisälä, M. S. (2010). Influence of Ohmic diffusion on the excitation and dynamics of MRI. *Astron. Nachr.*, 331:34.
- Korsós, M. B., Chatterjee, P., and Erdélyi, R. (2018). Applying the Weighted Horizontal Magnetic Gradient Method to a Simulated Flaring Active Region. *Astrophys. J.*, 857:103.
- Krüger, J., Haugen, N. E. L., Mitra, D., and Løvås, T. (2016). The effect of turbulent clustering on particle reactivity. *arXiv:1607.03720*.
- Krumholz, M. R. and Forbes, J. C. (2015). VADER: A flexible, robust, open-source code for simulating viscous thin accretion disks. *Astron. Computing*, 11:1–17.
- Kuchner, M. J., Richert, A. J. W., and Lyra, W. (2018). Rings and Spirals Forming by Themselves: the Photoelectric Instability in Debris Disks and Transitional disks, Now with Radiation Pressure. In *American Astronomical Society Meeting Abstracts*.
- Kulikov, I. (2013). A new GPU-accelerated hydrodynamical code for numerical simulation of interacting galaxies. *arXiv:1311.0861*.
- Kulikov, I., Chernykh, I., and Tutukov, A. (2016). A New Hydrodynamic Model for Numerical Simulation of Interacting Galaxies on Intel Xeon Phi Supercomputers. *J. Phys. Conf. Ser.*, 719(1):012006.
- Kupka, F. and Muthsam, H. J. (2017). Modelling of stellar convection. *Living Reviews in Computational Astrophysics*, 3(1):1.
- Lambrechts, M. (2011). Growth of Gas-giant Cores in Protoplanetary Discs. In *AAS/Division for Extreme Solar Systems Abstracts*, volume 2 of *AAS/Division for Extreme Solar Systems Abstracts*, page 33.02.
- Lambrechts, M. and Johansen, A. (2012). Rapid growth of gas-giant cores by pebble accretion. *Astron. Astrophys.*, 544:A32.
- Lambrechts, M., Johansen, A., Capelo, H. L., Blum, J., and Bodenschatz, E. (2016). Spontaneous concentrations of solids through two-way drag forces between gas and sedimenting particles. *Astron. Astrophys.*, 591:A133.
- Latter, H. N. and Papaloizou, J. C. B. (2012). Hysteresis and thermal limit cycles in MRI simulations of accretion discs. *Month. Not. Roy. Astron. Soc.*, 426:1107–1120.

- Lemaster, M. N. and Stone, J. M. (2009). Dissipation and Heating in Supersonic Hydrodynamic and MHD Turbulence. *Astrophys. J.*, 691:1092–1108.
- Li, R., Youdin, A. N., and Simon, J. B. (2018). On the Numerical Robustness of the Streaming Instability: Particle Concentration and Gas Dynamics in Protoplanetary Disks. *ArXiv e-prints*, page arXiv:1803.03638.
- Li, X.-Y., Brandenburg, A., Haugen, N. E. L., and Svensson, G. (2017a). Eulerian and Lagrangian approaches to multidimensional condensation and collection. *Journal of Advances in Modeling Earth Systems*, 9:1116–1137.
- Li, X.-Y., Brandenburg, A., Svensson, G., Haugen, N. E. L., Mehlig, B., and Rogachevskii, I. (2017b). Effect of turbulence on collisional growth of cloud droplets. *ArXiv e-prints*, page arXiv:1711.10062.
- Liljeström, A. J., Korpi, M. J., Käpylä, P. J., Brandenburg, A., and Lyra, W. (2009). Turbulent stresses as a function of shear rate in a local disk model. *Astron. Nachr.*, 330:92.
- Losada, I. R., Brandenburg, A., Kleeorin, N., Mitra, D., and Rogachevskii, I. (2012). Rotational effects on the negative magnetic pressure instability. *Astron. Astrophys.*, 548:A49.
- Losada, I. R., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2013). Competition of rotation and stratification in flux concentrations. *Astron. Astrophys.*, 556:A83.
- Losada, I. R., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2014). Magnetic flux concentrations in a polytropic atmosphere. *Astron. Astrophys.*, 564:A2.
- Losada, I. R., Warnecke, J., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2018). Magnetic bipoles in rotating turbulence with coronal envelope. *ArXiv e-prints*, page arXiv:1803.04446.
- Lovelace, R. V. E. and Romanova, M. M. (2014). Rossby wave instability in astrophysical discs. *Fluid Dynamics Research*, 46:041401.
- Lyra, W. (2013). Elliptic and magneto-elliptic instabilities. In *Europ. Phys. J. Web Conf.*, volume 46 of *Europ. Phys. J. Web Conf.*, page 4003.
- Lyra, W. (2014). Convective Overstability in Accretion Disks: Three-dimensional Linear Analysis and Nonlinear Saturation. *Astrophys. J.*, 789:77.
- Lyra, W., Johansen, A., Klahr, H., and Piskunov, N. (2008a). Embryos grown in the dead zone. Assembling the first protoplanetary cores in low mass self-gravitating circumstellar disks of gas and solids. *Astron. Astrophys.*, 491:L41–L44.
- Lyra, W., Johansen, A., Klahr, H., and Piskunov, N. (2008b). Global magnetohydrodynamical models of turbulence in protoplanetary disks. I. A cylindrical potential on a Cartesian grid and transport of solids. *Astron. Astrophys.*, 479:883–901.

- Lyra, W., Johansen, A., Klahr, H., and Piskunov, N. (2009a). Standing on the shoulders of giants. Trojan Earths and vortex trapping in low mass self-gravitating protoplanetary disks of gas and solids. *Astron. Astrophys.*, 493:1125–1139.
- Lyra, W., Johansen, A., Zsom, A., Klahr, H., and Piskunov, N. (2009b). Planet formation bursts at the borders of the dead zone in 2D numerical simulations of circumstellar disks. *Astron. Astrophys.*, 497:869–888.
- Lyra, W. and Klahr, H. (2011). The baroclinic instability in the context of layered accretion. Self-sustained vortices and their magnetic stability in local compressible unstratified models of protoplanetary disks. *Astron. Astrophys.*, 527:A138.
- Lyra, W. and Kuchner, M. (2013). Formation of sharp eccentric rings in debris disks with gas but without planets. *Nature*, 499:184–187.
- Lyra, W. and Kuchner, M. J. (2012). Sharp eccentric rings in planetless hydrodynamical models of debris disks. *arXiv:1204.6322*.
- Lyra, W. and Mac Low, M.-M. (2012). Rossby Wave Instability at Dead Zone Boundaries in Three-dimensional Resistive Magnetohydrodynamical Global Models of Protoplanetary Disks. *Astrophys. J.*, 756:62.
- Lyra, W., McNally, C. P., Heinemann, T., and Masset, F. (2017). Orbital Advection with Magnetohydrodynamics and Vector Potential. *Astron. J.*, 154:146.
- Lyra, W., Paardekooper, S.-J., and Mac Low, M.-M. (2010). Orbital Migration of Low-mass Planets in Evolutionary Radiative Models: Avoiding Catastrophic Infall. *Astrophys. J. Lett.*, 715:L68–L73.
- Lyra, W., Richert, A. J. W., Boley, A., Turner, N., Mac Low, M.-M., Okuzumi, S., and Flock, M. (2016). On Shocks Driven by High-mass Planets in Radiatively Inefficient Disks. II. Three-dimensional Global Disk Simulations. *Astrophys. J.*, 817:102.
- Lyra, W., Turner, N. J., and McNally, C. P. (2015). Rossby wave instability does not require sharp resistivity gradients. *Astron. Astrophys.*, 574:A10.
- Madarassy, E. J. M. and Brandenburg, A. (2010). Calibrating passive scalar transport in shear-flow turbulence. *Phys. Rev. E*, 82:016304.
- Mantere, M. J. and Cole, E. (2012). Dynamo Action in Thermally Unstable Interstellar Flows. *Astrophys. J.*, 753:32.
- Mantere, M. J., Käpylä, P. J., and Hackman, T. (2011). Dependence of the large-scale vortex instability on latitude, stratification, and domain size. *Astron. Nachr.*, 332:876.
- Mantere, M. J., Käpylä, P. J., and Pelt, J. (2013). Role of longitudinal activity complexes for solar and stellar dynamos. In Kosovichev, A. G., de Gouveia Dal Pino, E., and Yan, Y., editors, *IAU Symp.*, volume 294 of *IAU Symp.*, pages 175–186.

- Maron, J., Dennis, T., Howes, G., Brandenburg, A., Chandran, B., and Blackman, E. (2004). New Algorithms for Magnetohydrodynamics and Gravity that Emphasize Resolution and Speed. In *AAS/Division of Dynamical Astronomy Meeting #35*, volume 36 of *Bull. Am. Astron. Soc.*, page 854.
- Maron, J. and Mac Low, M.-M. (2009). Tuned Finite-Difference Diffusion Operators. *Astrophys. J. Supp.*, 182:468–473.
- Maron, J. L., Mac Low, M.-M., and Oishi, J. S. (2008). A Constrained-Transport Magnetohydrodynamics Algorithm with Near-Spectral Resolution. *Astrophys. J.*, 677:520–529.
- Maron, J. L., McNally, C. P., and Mac Low, M.-M. (2012). Phurbas: An Adaptive, Lagrangian, Meshless, Magnetohydrodynamics Code. I. Algorithm. *Astrophys. J. Supp.*, 200:6.
- Martínez Pillet, V. (2013). Solar Surface and Atmospheric Dynamics. The Photosphere. *Space Sci. Ref.*, 178:141–162.
- Matsumoto, Y. and Seki, K. (2008). Implementation of the CIP algorithm to magnetohydrodynamic simulations. *Computer Physics Communications*, 179:289–296.
- McMillan, D. G. and Sarson, G. R. (2003). Geodynamo Simulations Using a High Order Cartesian Magnetohydrodynamics Code. *AGU Fall Meeting Abstracts*.
- McMillan, D. G. and Sarson, G. R. (2005). Dynamo simulations in a spherical shell of ideal gas using a high-order cartesian magnetohydrodynamics code. *Physics of the Earth and Planetary Interiors*, 153:124–135.
- McNally, C. P. (2011). Divergence-free interpolation of vector fields from point values - exact $\nabla \cdot B = 0$ in numerical simulations. *Month. Not. Roy. Astron. Soc.*, 413:L76–L80.
- McNally, C. P., Hubbard, A., Yang, C.-C., and Mac Low, M.-M. (2014). Temperature Fluctuations Driven by Magnetorotational Instability in Protoplanetary Disks. *Astrophys. J.*, 791:62.
- McNally, C. P., Lyra, W., and Passy, J.-C. (2012a). A Well-posed Kelvin-Helmholtz Instability Test and Comparison. *Astrophys. J. Supp.*, 201:18.
- McNally, C. P., Maron, J. L., and Mac Low, M.-M. (2012b). Phurbas: An Adaptive, Lagrangian, Meshless, Magnetohydrodynamics Code. II. Implementation and Tests. *Astrophys. J. Supp.*, 200:7.
- Mee, A. J. and Brandenburg, A. (2006). Turbulence from localized random expansion waves. *Month. Not. Roy. Astron. Soc.*, 370:415–419.
- Mitra, D., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2014). Intense bipolar structures from stratified helical dynamos. *Month. Not. Roy. Astron. Soc.*, 445:761–769.
- Mitra, D., Candelaresi, S., Chatterjee, P., Tavakol, R., and Brandenburg, A. (2010a). Equatorial magnetic helicity flux in simulations with different gauges. *Astron. Nachr.*, 331:130.

- Mitra, D., Haugen, N. E. L., and Rogachevskii, I. (2018). Turbophoresis in forced inhomogeneous turbulence. *European Physical Journal Plus*, 133:35.
- Mitra, D., Käpylä, P. J., Tavakol, R., and Brandenburg, A. (2009a). Alpha effect and diffusivity in helical turbulence with shear. *Astron. Astrophys.*, 495:1–8.
- Mitra, D., Moss, D., Tavakol, R., and Brandenburg, A. (2011). Alleviating α quenching by solar wind and meridional flows. *Astron. Astrophys.*, 526:A138.
- Mitra, D., Tavakol, R., Brandenburg, A., and Käpylä, P. J. (2010b). Oscillatory migratory large-scale fields in mean-field and direct simulations. In Kosovichev, A. G., Andrei, A. H., and Rozelot, J.-P., editors, *IAU Symp.*, volume 264 of *IAU Symp.*, pages 197–201.
- Mitra, D., Tavakol, R., Brandenburg, A., and Moss, D. (2009b). Turbulent Dynamos in Spherical Shell Segments of Varying Geometrical Extent. *Astrophys. J.*, 697:923–933.
- Mitra, D., Tavakol, R., Käpylä, P. J., and Brandenburg, A. (2010c). Oscillatory Migrating Magnetic Fields in Helical Turbulence in Spherical Domains. *Astrophys. J. Lett.*, 719:L1–L4.
- Mitra, D., Wettlaufer, J. S., and Brandenburg, A. (2013). Can Planetesimals Form by Collisional Fusion? *Astrophys. J.*, 773:120.
- Mocz, P., Vogelsberger, M., Pakmor, R., Genel, S., Springel, V., and Hernquist, L. (2015). Reducing noise in moving-grid codes with strongly-centroidal Lloyd mesh regularization. *Month. Not. Roy. Astron. Soc.*, 452:3853–3862.
- Modestov, M., Bychkov, V., Brodin, G., Marklund, M., and Brandenburg, A. (2014). Evolution of the magnetic field generated by the Kelvin-Helmholtz instability. *Physics of Plasmas*, 21:072126.
- Nixon, C. J., King, A. R., and Pringle, J. E. (2018). The Maximum Mass Solar Nebula and the early formation of planets. *Month. Not. Roy. Astron. Soc.*, 477:3273–3278.
- Nordlund, Å. (2004). Magnetohydrodynamics of the Solar Atmosphere. In Sakurai, T. and Sekii, T., editors, *The Solar-B Mission and the Forefront of Solar Physics*, volume 325 of *Astron. Soc. Pac. Conf. Ser.*, page 165.
- Norton, A. A., Charbonneau, P., and Passos, D. (2014). Hemispheric Coupling: Comparing Dynamo Simulations and Observations. *Space Sci. Ref.*, 186:251–283.
- Oishi, J. S., Brown, B. P., Burns, K. J., Lecoanet, D., and Vasil, G. M. (2018). Perspectives on Reproducibility and Sustainability of Open-Source Scientific Software from Seven Years of the Dedalus Project. *ArXiv e-prints*, page arXiv:1801.08200.
- Oishi, J. S. and Mac Low, M.-M. (2009). On Hydrodynamic Motions in Dead Zones. *Astrophys. J.*, 704:1239–1250.

- Oishi, J. S. and Mac Low, M.-M. (2011). Magnetorotational Turbulence Transports Angular Momentum in Stratified Disks with Low Magnetic Prandtl Number but Magnetic Reynolds Number above a Critical Value. *Astrophys. J.*, 740:18.
- Oishi, J. S., Mac Low, M.-M., and Menou, K. (2007). Turbulent Torques on Protoplanets in a Dead Zone. *Astrophys. J.*, 670:805–819.
- Olshevsky, V., Liang, C., and Ham, F. (2014). Turbulent convection in the Sun: modeling in unstructured meshes. *arXiv:1412.7318*.
- Osano, B. and Adams, P. (2016a). Analogue Magnetism Revisited. *arXiv:1602.09105*.
- Osano, B. and Adams, P. W. (2016b). Analogue Magnetism: An Ansatz. *arXiv:1607.00980*.
- Osano, B. and Adams, P. W. (2016c). Toward the analogue of thermally generated electromagnetic fields. *arXiv:1606.03413*.
- Osano, B. and Adams, P. W. M. (2017). Toward the analogue of a thermally generated electromagnetic field. *Journal of Mathematical Physics*, 58:093101.
- Ouyed, R., Niebergal, B., Dobler, W., and Leahy, D. (2006). Three-Dimensional Simulations of the Reorganization of a Quark Star’s Magnetic Field as Induced by the Meissner Effect. *Astrophys. J.*, 653:558–567.
- Pan, L. and Padoan, P. (2013). Turbulence-induced Relative Velocity of Dust Particles. I. Identical Particles. *Astrophys. J.*, 776:12.
- Pan, L. and Padoan, P. (2014). Turbulence-induced Relative Velocity of Dust Particles. IV. The Collision Kernel. *Astrophys. J.*, 797:101.
- Pan, L., Padoan, P., and Scalo, J. (2014a). Turbulence-induced Relative Velocity of Dust Particles. II. The Bidisperse Case. *Astrophys. J.*, 791:48.
- Pan, L., Padoan, P., and Scalo, J. (2014b). Turbulence-induced Relative Velocity of Dust Particles. III. The Probability Distribution. *Astrophys. J.*, 792:69.
- Park, K. (2013a). Influence of initial conditions on the large-scale dynamo growth rate. *Month. Not. Roy. Astron. Soc.*, 434:2020–2031.
- Park, K. (2013b). *Theory and Simulation of Magnetohydrodynamic Dynamos and Faraday Rotation for Plasmas of General Composition*. PhD thesis, University of Rochester.
- Park, K. (2014a). Influence of small-scale E_M and H_M on the growth of large-scale magnetic field. *Month. Not. Roy. Astron. Soc.*, 444:3837–3844.
- Park, K. (2014b). Influence of small scale magnetic energy and helicity on the growth of large scale magnetic field. *arXiv:1403.1328*.

- Park, K. (2015). Dynamo model for the inverse transfer of magnetic energy in a nonhelical decaying magnetohydrodynamic turbulence. *arXiv:1509.00788*.
- Park, K. (2017). Amplification of large scale magnetic fields in a decaying MHD system. *Phys. Rev. D*, 96:083505.
- Park, K. and Blackman, E. G. (2012a). Comparison between turbulent helical dynamo simulations and a non-linear three-scale theory. *Month. Not. Roy. Astron. Soc.*, 419:913–924.
- Park, K. and Blackman, E. G. (2012b). Simulations of a magnetic fluctuation driven large-scale dynamo and comparison with a two-scale model. *Month. Not. Roy. Astron. Soc.*, 423:2120–2131.
- Park, K., Blackman, E. G., and Subramanian, K. (2013). Large-scale dynamo growth rates from numerical simulations and implications for mean-field theories. *Phys. Rev. E*, 87:053110.
- Park, K. and Park, D. (2015). Evolution of Kinetic and Magnetic Energy in Intra Cluster Media. *arXiv:1504.02940*.
- Pearson, B. R., Yousef, T. A., Haugen, N. E. L., Brandenburg, A., and Krogstad, P.-Å. (2004). Delayed correlation between turbulent energy injection and dissipation. *Phys. Rev. E*, 70:056301.
- Pekkilä, J., Väisälä, M. S., Käpylä, M. J., Käpylä, P. J., and Anjum, O. (2017). Methods for compressible fluid simulation on GPUs using high-order finite differences. *Computer Physics Communications*, 217:11–22.
- Perri, B. and Brandenburg, A. (2018). Spontaneous flux concentrations from the negative effective magnetic pressure instability beneath a radiative stellar surface. *Astron. Astrophys.*, 609:A99.
- Peter, H. and Bingert, S. (2012). Constant cross section of loops in the solar corona. *Astron. Astrophys.*, 548:A1.
- Peter, H., Bingert, S., and Kamio, S. (2012). Catastrophic cooling and cessation of heating in the solar corona. *Astron. Astrophys.*, 537:A152.
- Piontek, R. A., Gressel, O., and Ziegler, U. (2009). Multiphase ISM simulations: comparing NIRVANA and ZEUS. *Astron. Astrophys.*, 499:633–641.
- Rädler, K.-H. and Brandenburg, A. (2008). α -effect dynamos with zero kinetic helicity. *Phys. Rev. E*, 77:026405.
- Rädler, K.-H. and Brandenburg, A. (2009). Mean-field effects in the Galloway-Proctor flow. *Month. Not. Roy. Astron. Soc.*, 393:113–125.
- Rädler, K.-H. and Brandenburg, A. (2010). Mean electromotive force proportional to mean flow in MHD turbulence. *Astron. Nachr.*, 331:14.

- Rädler, K.-H., Brandenburg, A., Del Sordo, F., and Rheinhardt, M. (2011). Mean-field diffusivities in passive scalar and magnetic transport in irrotational flows. *Phys. Rev. E*, 84:046321.
- Raettig, N., Klahr, H., and Lyra, W. (2015). Particle Trapping and Streaming Instability in Vortices in Protoplanetary Disks. *Astrophys. J.*, 804:35.
- Raettig, N., Lyra, W., and Klahr, H. (2013). A Parameter Study for Baroclinic Vortex Amplification. *Astrophys. J.*, 765:115.
- Recchi, S. (2014). Chemodynamical Simulations of Dwarf Galaxy Evolution. *Adv. Astron.*, 2014.
- Rein, H. (2012). A proposal for community driven and decentralized astronomical databases and the Open Exoplanet Catalogue. *arXiv:1211.7121*.
- Rempel, E. L., C-L Chian, A., and Brandenburg, A. (2012). Lagrangian chaos in an ABC-forced nonlinear dynamo. *Phys. Scr.*, 86:018405.
- Rempel, E. L., Chian, A. C. L., Beron-Vera, F. J., Szanyi, S., and Haller, G. (2017). Objective vortex detection in an astrophysical dynamo. *Month. Not. Roy. Astron. Soc.*, 466:L108–L112.
- Rempel, E. L., Chian, A. C.-L., and Brandenburg, A. (2011). Lagrangian Coherent Structures in Nonlinear Dynamos. *Astrophys. J. Lett.*, 735:L9.
- Rempel, E. L., Chian, A. C.-L., Brandenburg, A., Muñoz, P. R., and Shadden, S. C. (2013). Coherent structures and the saturation of a nonlinear dynamo. *J. Fluid Mech.*, 729:309–329.
- Rempel, E. L., Proctor, M. R. E., and Chian, A. C.-L. (2009). A novel type of intermittency in a non-linear dynamo in a compressible flow. *Month. Not. Roy. Astron. Soc.*, 400:509–517.
- Reppin, J. and Banerjee, R. (2017). Nonhelical turbulence and the inverse transfer of energy: A parameter study. *Phys. Rev. E*, 96:053105.
- Rheinhardt, M. and Brandenburg, A. (2010). Test-field method for mean-field coefficients with MHD background. *Astron. Astrophys.*, 520:A28.
- Rheinhardt, M. and Brandenburg, A. (2012). Modeling spatio-temporal nonlocality in mean-field dynamos. *Astron. Nachr.*, 333:71–77.
- Rheinhardt, M., Devlen, E., Rädler, K.-H., and Brandenburg, A. (2014). Mean-field dynamo action from delayed transport. *Month. Not. Roy. Astron. Soc.*, 441:116–126.
- Rice, K. and Nayakshin, S. (2018). On fragmentation of turbulent self-gravitating discs in the long cooling time regime. *Month. Not. Roy. Astron. Soc.*, 475:921–931.
- Rice, W. K. M., Armitage, P. J., Mamatsashvili, G. R., Lodato, G., and Clarke, C. J. (2011). Stability of self-gravitating discs under irradiation. *Month. Not. Roy. Astron. Soc.*, 418:1356–1362.

- Rice, W. K. M., Forgan, D. H., and Armitage, P. J. (2012). Convergence of smoothed particle hydrodynamics simulations of self-gravitating accretion discs: sensitivity to the implementation of radiative cooling. *Month. Not. Roy. Astron. Soc.*, 420:1640–1647.
- Richert, A. J. W., Lyra, W., Boley, A., Mac Low, M.-M., and Turner, N. (2015). On Shocks Driven by High-mass Planets in Radiatively Inefficient Disks. I. Two-dimensional Global Disk Simulations. *Astrophys. J.*, 804:95.
- Richert, A. J. W., Lyra, W., and Kuchner, M. J. (2018). The Interplay between Radiation Pressure and the Photoelectric Instability in Optically Thin Disks of Gas and Dust. *Astrophys. J.*, 856:41.
- Rieutord, M. (2008). The solar dynamo. *Comptes Rendus Physique*, 9:757–765.
- Rieutord, M. (2014). Magnetohydrodynamics and Solar Physics. In Ballet, J., Martins, F., Bornaud, F., Monier, R., and Reylé, C., editors, *SF2A-2014: Proc. Ann. Meeting French Soc. Astron. Astrophys.*, pages 45–50.
- Rodrigues, L. F. S., Sarson, G. R., Shukurov, A., Bushby, P. J., and Fletcher, A. (2016). The Parker Instability in Disk Galaxies. *Astrophys. J.*, 816:2.
- Rogachevskii, I., Kleeorin, N., Brandenburg, A., and Eichler, D. (2012). Cosmic-Ray Current-driven Turbulence and Mean-field Dynamo Effect. *Astrophys. J.*, 753:6.
- Rogachevskii, I., Kleeorin, N., Käpylä, P. J., and Brandenburg, A. (2011). Pumping velocity in homogeneous helical turbulence with shear. *Phys. Rev. E*, 84:056314.
- Rovithis-Livaniou, E. (2010). Latest Results in the Field of Exoplanets. *Publ. l’Observatoire Astron. de Beograd*, 90:105–112.
- Rüdiger, G. (2005). Taylor-Couette flow: MRI, SHI and SRI. *astro-ph/0507313*.
- Rüdiger, G. and Brandenburg, A. (2014). α effect in a turbulent liquid-metal plane Couette flow. *Phys. Rev. E*, 89:033009.
- Rüdiger, G., Gellert, M., Hollerbach, R., Schultz, M., and Stefani, F. (2018). Stability and instability of hydromagnetic Taylor-Couette flows. *Phys. Rep.*, 741:1–89.
- Rüdiger, G., Kitchatinov, L. L., and Brandenburg, A. (2011). Cross Helicity and Turbulent Magnetic Diffusivity in the Solar Convection Zone. *Sol. Phys.*, 269:3–12.
- Ruoskanen, J., Harju, J., Juvela, M., Miettinen, O., Liljeström, A., Väisälä, M., Lunttila, T., and Kontinen, S. (2011). Mapping the prestellar core Ophiuchus D (L1696A) in ammonia. *Astron. Astrophys.*, 534:A122.
- Ruszkowski, M., Enßlin, T. A., Brüggen, M., Begelman, M. C., and Churazov, E. (2008). Cosmic ray confinement in fossil cluster bubbles. *Month. Not. Roy. Astron. Soc.*, 383:1359–1365.

- Ruszkowski, M., Enßlin, T. A., Brüggén, M., Heinz, S., and Pfrommer, C. (2007). Impact of tangled magnetic fields on fossil radio bubbles. *Month. Not. Roy. Astron. Soc.*, 378:662–672.
- Ryu, C.-M. and Huynh, C. T. (2017). Propagation and damping of Alfvén waves in low solar atmosphere. *Month. Not. Roy. Astron. Soc.*, 471:2237–2241.
- Schad, A., Jouve, L., Duvall, T. L., Roth, M., and Vorontsov, S. (2015). Recent Developments in Helioseismic Analysis Methods and Solar Data Assimilation. *Space Sci. Ref.*, 196:221–249.
- Scharmer, G. B., Nordlund, Å., and Heinemann, T. (2008). Convection and the Origin of Evershed Flows in Sunspot Penumbrae. *Astrophys. J. Lett.*, 677:L149–L152.
- Schekochihin, A. A., Haugen, N. E. L., Brandenburg, A., Cowley, S. C., Maron, J. L., and McWilliams, J. C. (2005). The Onset of a Small-Scale Turbulent Dynamo at Low Magnetic Prandtl Numbers. *Astrophys. J. Lett.*, 625:L115–L118.
- Schekochihin, A. A., Iskakov, A. B., Cowley, S. C., McWilliams, J. C., Proctor, M. R. E., and Yousef, T. A. (2007). Fluctuation dynamo and turbulent induction at low magnetic Prandtl numbers. *New J. Phys.*, 9:300.
- Schober, J., Brandenburg, A., Rogachevskii, I., and Kleeorin, N. (2018a). Magnetic Prandtl number dependence of turbulence generated by chiral MHD dynamos. *ArXiv e-prints*, page arXiv:1803.06350.
- Schober, J., Rogachevskii, I., Brandenburg, A., Boyarsky, A., Fröhlich, J., Ruchayskiy, O., and Kleeorin, N. (2018b). Laminar and Turbulent Dynamos in Chiral Magnetohydrodynamics. II. Simulations. *Astrophys. J.*, 858:124.
- Schreiber, A. and Klahr, H. (2018). Azimuthal and Vertical Streaming Instability at High Dust-to-gas Ratios and on the Scales of Planetesimal Formation. *ArXiv e-prints*, page arXiv:1805.04326.
- Sharma, R., Mitra, D., and Oberoi, D. (2017). On the energization of charged particles by fast magnetic reconnection. *Month. Not. Roy. Astron. Soc.*, 470:723–731.
- Shukurov, A., Sokoloff, D., Subramanian, K., and Brandenburg, A. (2006). Galactic dynamo and helicity losses through fountain flow. *Astron. Astrophys.*, 448:L33–L36.
- Simon, J. B., Armitage, P. J., Li, R., and Youdin, A. N. (2016). The Mass and Size Distribution of Planetesimals Formed by the Streaming Instability. I. The Role of Self-gravity. *Astrophys. J.*, 822:55.
- Singh, N. K., Brandenburg, A., Chitre, S. M., and Rheinhardt, M. (2015). Properties of p and f modes in hydromagnetic turbulence. *Month. Not. Roy. Astron. Soc.*, 447:3708–3722.
- Singh, N. K., Brandenburg, A., and Rheinhardt, M. (2014). Fanning Out of the Solar f-mode in the Presence of Non-uniform Magnetic Fields? *Astrophys. J. Lett.*, 795:L8.

- Singh, N. K. and Jingade, N. (2015). Numerical Studies of Dynamo Action in a Turbulent Shear Flow. I. *Astrophys. J.*, 806:118.
- Singh, N. K., Rogachevskii, I., and Brandenburg, A. (2017). Enhancement of Small-scale Turbulent Dynamo by Large-scale Shear. *Astrophys. J.*, 850:L8.
- Skála, J., Baruffa, F., Büchner, J., and Rampp, M. (2014). The 3D MHD code GOEMHD3 for large-Reynolds-number astrophysical plasmas. *arXiv:1411.1289*.
- Skála, J., Baruffa, F., Büchner, J., and Rampp, M. (2015). The 3D MHD code GOEMHD3 for astrophysical plasmas with large Reynolds numbers. Code description, verification, and computational performance. *Astron. Astrophys.*, 580:A48.
- Smiet, C. B., Candelaresi, S., Thompson, A., Swarngin, J., Dalhuisen, J. W., and Bouwmeester, D. (2015). Self-Organizing Knotted Magnetic Structures in Plasma. *Physical Review Letters*, 115:095001.
- Smiet, C. B., Thompson, A., Bouwmeester, P., and Bouwmeester, D. (2017). Magnetic surface topology in decaying plasma knots. *New Journal of Physics*, 19:023046.
- Snellman, J. E., Brandenburg, A., Käpylä, P. J., and Mantere, M. J. (2012a). Verification of Reynolds stress parameterizations from simulations. *Astron. Nachr.*, 333:78.
- Snellman, J. E., Käpylä, P. J., Käpylä, M. J., and Rheinhardt, M. (2015). Testing turbulent closure models with convection simulations. *Astron. Nachr.*, 336:32–52.
- Snellman, J. E., Käpylä, P. J., Korpi, M. J., and Liljeström, A. J. (2009). Reynolds stresses from hydrodynamic turbulence with shear and rotation. *Astron. Astrophys.*, 505:955–968.
- Snellman, J. E., Rheinhardt, M., Käpylä, P. J., Mantere, M. J., and Brandenburg, A. (2012b). Mean-field closure parameters for passive scalar turbulence. *Phys. Scr.*, 86:018406.
- Snodin, A. P., Brandenburg, A., Mee, A. J., and Shukurov, A. (2006). Simulating field-aligned diffusion of a cosmic ray gas. *Month. Not. Roy. Astron. Soc.*, 373:643–652.
- Stone, J. M. and Gardiner, T. A. (2010). Implementation of the Shearing Box Approximation in Athena. *Astrophys. J. Supp.*, 189:142–155.
- Subramanian, K. and Brandenburg, A. (2014). Traces of large-scale dynamo action in the kinematic stage. *Month. Not. Roy. Astron. Soc.*, 445:2930–2940.
- Sur, S. and Brandenburg, A. (2009). The role of the Yoshizawa effect in the Archontis dynamo. *Month. Not. Roy. Astron. Soc.*, 399:273–280.
- Sur, S., Brandenburg, A., and Subramanian, K. (2008). Kinematic α -effect in isotropic turbulence simulations. *Month. Not. Roy. Astron. Soc.*, 385:L15–L19.

- Sur, S., Subramanian, K., and Brandenburg, A. (2007). Kinetic and magnetic α -effects in non-linear dynamo theory. *Month. Not. Roy. Astron. Soc.*, 376:1238–1250.
- Survile, C., Mayer, L., and Lin, D. N. C. (2016). Dust Capture and Long-lived Density Enhancements Triggered by Vortices in 2D Protoplanetary Disks. *Astrophys. J.*, 831:82.
- Svedin, A., Cuéllar, M. C., and Brandenburg, A. (2013). Data assimilation for stratified convection. *Month. Not. Roy. Astron. Soc.*, 433:2278–2285.
- Tarjei Jensen, J., Haugen, N. E. L., and Babkovskaia, N. (2011). Calculation of the Minimum Ignition Energy based on the ignition delay time. *arXiv:1110.1163*.
- Tevzadze, A. G., Kisslinger, L., Brandenburg, A., and Kahniashvili, T. (2012). Magnetic Fields from QCD Phase Transitions. *Astrophys. J.*, 759:54.
- Thévenin, F., Bigot, L., Kervella, P., Lopez, B., Pichon, B., and Schmider, F.-X. (2006). Astero-seismology and interferometry. *Mem. Soc. Astr. Ital.*, 77:411.
- Threlfall, J., Bourdin, P.-A., Neukirch, T., and Parnell, C. E. (2016). Particle dynamics in a non-flaring solar active region model. *Astron. Astrophys.*, 587:A4.
- Tian, C. and Chen, Y. (2016). Numerical Simulations of Kelvin–Helmholtz Instability: A Two-dimensional Parametric Study. *Astrophys. J.*, 824:60.
- Tilgner, A. and Brandenburg, A. (2008). A growing dynamo from a saturated Roberts flow dynamo. *Month. Not. Roy. Astron. Soc.*, 391:1477–1481.
- Trivedi, P., Reppin, J., Chluba, J., and Banerjee, R. (2018). Magnetic heating across the cosmological recombination era: Results from 3D MHD simulations. *ArXiv e-prints*, page arXiv:1805.05315.
- Turck-Chièze, S. (2010). Concluding remarks on solar and stellar activities and related planets. In Kosovichev, A. G., Andrei, A. H., and Rozelot, J.-P., editors, *Solar and Stellar Variability: Impact on Earth and Planets*, volume 264 of *IAU Symp.*, pages 507–523.
- Turner, N. J., Fromang, S., Gammie, C., Klahr, H., Lesur, G., Wardle, M., and Bai, X.-N. (2014). Transport and Accretion in Planet-Forming Disks. *Protostars and Planets VI*, pages 411–432.
- Turner, N. J., Willacy, K., Bryden, G., and Yorke, H. W. (2006). Turbulent Mixing in the Outer Solar Nebula. *Astrophys. J.*, 639:1218–1226.
- Väisälä, M. S., Brandenburg, A., Mitra, D., Käpylä, P. J., and Mantere, M. J. (2014). Quantifying the effect of turbulent magnetic diffusion on the growth rate of the magneto-rotational instability. *Astron. Astrophys.*, 567:A139.
- van Wettum, T., Bingert, S., and Peter, H. (2013). Parameterisation of coronal heating: spatial distribution and observable consequences. *Astron. Astrophys.*, 554:A39.

- Vermersch, V. and Brandenburg, A. (2009). Shear-driven magnetic buoyancy oscillations. *Astron. Nachr.*, 330:797.
- Viallet, M., Baraffe, I., and Walder, R. (2011). Towards a new generation of multi-dimensional stellar evolution models: development of an implicit hydrodynamic code. *Astron. Astrophys.*, 531:A86.
- Viviani, M., Warnecke, J., Käpylä, M. J., Käpylä, P. J., Olsper, N., Cole-Kodikara, E. M., Lehtinen, J. J., and Brandenburg, A. (2017). Transition from axi- to nonaxisymmetric dynamo modes in spherical convection models of solar-like stars. *ArXiv e-prints*, page arXiv:1710.10222.
- Vshivkov, V. A., Lazareva, G. G., Snytnikov, A. V., Kulikov, I. M., and Tutukov, A. V. (2011). Hydrodynamical Code for Numerical Simulation of the Gas Components of Colliding Galaxies. *Astrophys. J. Supp.*, 194:47.
- Warnecke, J. and Brandenburg, A. (2010). Surface appearance of dynamo-generated large-scale fields. *Astron. Astrophys.*, 523:A19.
- Warnecke, J. and Brandenburg, A. (2011a). Dynamo generated field emergence through recurrent plasmoid ejections. In Prasad Choudhary, D. and Strassmeier, K. G., editors, *IAU Symp.*, volume 273 of *IAU Symp.*, pages 256–260.
- Warnecke, J. and Brandenburg, A. (2011b). Recurrent flux emergence from dynamo-generated fields. In Brummell, N. H., Brun, A. S., Miesch, M. S., and Ponty, Y., editors, *IAU Symp.*, volume 271 of *IAU Symp.*, pages 407–408.
- Warnecke, J. and Brandenburg, A. (2014). Coronal influence on dynamos. In *IAU Symp.*, volume 302 of *IAU Symp.*, pages 134–137.
- Warnecke, J., Brandenburg, A., and Mitra, D. (2011a). Dynamo-driven plasmoid ejections above a spherical surface. *Astron. Astrophys.*, 534:A11.
- Warnecke, J., Brandenburg, A., and Mitra, D. (2011b). Plasmoid ejections driven by dynamo action underneath a spherical surface. In Bonanno, A., de Gouveia Dal Pino, E., and Kosovichev, A. G., editors, *IAU Symp.*, volume 274 of *IAU Symp.*, pages 306–309.
- Warnecke, J., Brandenburg, A., Mitra, D. A., and) (2012a). Magnetic twist: a source and property of space weather. *J. Space Weather Space Climate*, 2:A260000.
- Warnecke, J., Käpylä, P. J., Käpylä, M. J., and Brandenburg, A. (2014). On The Cause of Solar-like Equatorward Migration in Global Convective Dynamo Simulations. *Astrophys. J. Lett.*, 796:L12.
- Warnecke, J., Käpylä, P. J., Mantere, M. J., and Brandenburg, A. (2012b). Coronal ejections from convective spherical shell dynamos. In Mandrini, C. H. and Webb, D. F., editors, *IAU Symp.*, volume 286 of *IAU Symp.*, pages 154–158.

- Warnecke, J., Käpylä, P. J., Mantere, M. J., and Brandenburg, A. (2012c). Ejections of Magnetic Structures Above a Spherical Wedge Driven by a Convective Dynamo with Differential Rotation. *Sol. Phys.*, 280:299–319.
- Warnecke, J., Käpylä, P. J., Mantere, M. J., and Brandenburg, A. (2013a). Solar-like differential rotation and equatorward migration in a convective dynamo with a coronal envelope. In Kosovichev, A. G., de Gouveia Dal Pino, E., and Yan, Y., editors, *IAU Symp.*, volume 294 of *IAU Symp.*, pages 307–312.
- Warnecke, J., Käpylä, P. J., Mantere, M. J., and Brandenburg, A. (2013b). Spoke-like Differential Rotation in a Convective Dynamo with a Coronal Envelope. *Astrophys. J.*, 778:141.
- Warnecke, J., Losada, I. R., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2013c). Bipolar Magnetic Structures Driven by Stratified Turbulence with a Coronal Envelope. *Astrophys. J. Lett.*, 777:L37.
- Warnecke, J., Losada, I. R., Brandenburg, A., Kleeorin, N., and Rogachevskii, I. (2016a). Bipolar region formation in stratified two-layer turbulence. *Astron. Astrophys.*, 589:A125.
- Warnecke, J., Rheinhardt, M., Käpylä, P. J., Käpylä, M. J., and Brandenburg, A. (2016b). Turbulent transport coefficients in spherical wedge dynamo simulations of solar-like stars. *arXiv:1601.03730*.
- Workman, J. C. and Armitage, P. J. (2008). Interaction of the Magnetorotational Instability with Hydrodynamic Turbulence in Accretion Disks. *Astrophys. J.*, 685:406–417.
- Yamamoto, S. and Makino, J. (2017). A formulation of consistent particle hydrodynamics in strong form. *Pub. Astron. Soc. Japan*, 69:35.
- Yang, C.-C. and Johansen, A. (2014a). Large-scale planetesimal formation by streaming instability. In Booth, M., Matthews, B. C., and Graham, J. R., editors, *Exploring the Formation and Evolution of Planetary Systems*, volume 299 of *IAU Symp.*, pages 177–178.
- Yang, C.-C. and Johansen, A. (2014b). On the Feeding Zone of Planetesimal Formation by the Streaming Instability. *Astrophys. J.*, 792:86.
- Yang, C.-C. and Johansen, A. (2016). Integration of Particle-gas Systems with Stiff Mutual Drag Interaction. *Astrophys. J. Supp.*, 224:39.
- Yang, C.-C. and Krumholz, M. (2012). Thermal-instability-driven Turbulent Mixing in Galactic Disks. I. Effective Mixing of Metals. *Astrophys. J.*, 758:48.
- Yang, C.-C., Mac Low, M.-M., and Menou, K. (2009). Planetesimal and Protoplanet Dynamics in a Turbulent Protoplanetary Disk: Ideal Unstratified Disks. *Astrophys. J.*, 707:1233–1246.
- Yang, C.-C., Mac Low, M.-M., and Menou, K. (2012). Planetesimal and Protoplanet Dynamics in a Turbulent Protoplanetary Disk: Ideal Stratified Disks. *Astrophys. J.*, 748:79.

- Yokoi, N. and Brandenburg, A. (2016). Large-scale flow generation by inhomogeneous helicity. *Phys. Rev. E*, 93:033125.
- Youdin, A. and Johansen, A. (2007). Protoplanetary Disk Turbulence Driven by the Streaming Instability: Linear Evolution and Numerical Methods. *Astrophys. J.*, 662:613–626.
- Youdin, A. N. and Johansen, A. (2008). Planetesimal Formation with Particle Feedback. In Fischer, D., Rasio, F. A., Thorsett, S. E., and Wolszczan, A., editors, *Extreme Solar Systems*, volume 398 of *Astron. Soc. Pac. Conf. Ser.*, page 219.
- Yousef, T. A. and Brandenburg, A. (2003). Relaxation of writhe and twist of a bi-helical magnetic field. *Astron. Astrophys.*, 407:7–12.
- Yousef, T. A., Brandenburg, A., and Rüdiger, G. (2003). Turbulent magnetic Prandtl number and magnetic diffusivity quenching from simulations. *Astron. Astrophys.*, 411:321–327.
- Yousef, T. A., Haugen, N. E. L., and Brandenburg, A. (2004). Self-similar scaling in decaying numerical turbulence. *Phys. Rev. E*, 69:056303.
- Yousef, T. A., Heinemann, T., Schekochihin, A. A., Kleeorin, N., Rogachevskii, I., Iskakov, A. B., Cowley, S. C., and McWilliams, J. C. (2008). Generation of Magnetic Field by Combined Action of Turbulence and Shear. *Phys. Rev. Lett.*, 100:184501.
- Zacharias, P., Bingert, S., and Peter, H. (2009a). Doppler shifts in the transition region and corona. Mass cycle between the chromosphere and the corona. *Mem. Soc. Astr. Ital.*, 80:654.
- Zacharias, P., Bingert, S., and Peter, H. (2009b). Spectral analysis of 3D MHD models of coronal structures. *Advances in Space Research*, 43:1451–1456.
- Zacharias, P., Peter, H., and Bingert, S. (2011a). Ejection of cool plasma into the hot corona. *Astron. Astrophys.*, 532:A112.
- Zacharias, P., Peter, H., and Bingert, S. (2011b). Investigation of mass flows in the transition region and corona in a three-dimensional numerical model approach. *Astron. Astrophys.*, 531:A97.
- Zhang, H. and Yan, H. (2018). Polarization of submillimetre lines from interstellar medium. *Month. Not. Roy. Astron. Soc.*, 475:2415–2420.
- Ziegler, U. (2011). A semi-discrete central scheme for magnetohydrodynamics on orthogonal-curvilinear grids. *J. Comp. Phys.*, 230:1035–1063.